

**Appendix AA**  
**Riparian, Wetland, and Terrestrial Environments**  
**Assessment Documentation**

## **Wetland Baseline Review (WSP 2018a)**

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GHD LIMITED

# BOAT HARBOUR REMEDIATION PLANNING AND DESIGN

## WETLAND BASELINE REVIEW

PICTOU, NS

APRIL 27, 2018

CONFIDENTIAL





# BOAT HARBOUR REMEDICATION PLANNING AND DESIGN

## WETLAND BASELINE REVIEW

GHD LIMITED

**CONFIDENTIAL**

**WSP PROJECT NO.: 171-10478-00**

**DATE: APRIL 27, 2018**

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April 27, 2018

CONFIDENTIAL

**Attention: Peter Oram, P. Geo**

GHD Limited

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Dartmouth, NS B3B 1J7

Dear Sir:

**Subject: Boat Harbour Remediation Planning and Design – Wetland Baseline Review**

WSP Canada Inc. was retained to complete baseline wetland delineation and wetland functional assessments for the Boat Harbour Effluent Treatment Facility (BHETF) located in Pictou County, Nova Scotia, to gain an understanding of the current conditions at Boat Harbour. It is understood that GHD Limited (GHD) on behalf of Nova Scotia Lands inc. is planning remedial action for BHETF and requires a baseline conditions report.

This report summarizes the findings of the wetland delineation and functional assessments of the site.

Yours sincerely,

A handwritten signature in black ink that reads 'Marina Dulmage'.

Marina Dulmage, M.Sc.  
Biologist

A handwritten signature in black ink that reads 'Christina LaFlamme'.

Christina LaFlamme, M.Sc., EP  
Senior Biologist

cc: Sean Cassidy

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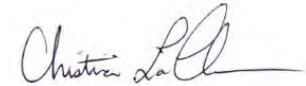
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# 1 WETLAND IDENTIFICATION AND DELINEATION

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## 1.1 BACKGROUND AND MAPPING REVIEW

A desktop review of provincial databases, topographic mapping, Service Nova Scotia and Municipal Relations Property Online, and available satellite imagery was conducted to assist in the identification of wetland areas within the study boundaries of the Boat Harbour Effluent Treatment Facility (BHETF). Provincially mapped wetlands were identified using the Nova Scotia Wetland Vegetation and Classification Inventory data, and areas of elevated potential for unmapped wetland habitat were identified by reviewing Nova Scotia Wet Areas data, site topography and distribution of natural features. In addition, during a site reconnaissance conducted between August 9<sup>th</sup> and August 11<sup>th</sup>, all wetland areas or suspected wetland areas were marked with Global Positioning System (GPS) points.

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## 1.2 METHODOLOGY

### 1.2.1 WETLAND IDENTIFICATION

Field surveys were conducted during the months of August and September, 2017 with the exception of WL-25 which was surveyed at the end of November, 2017. Targeted surveys to confirm and delineate wetland habitat were conducted in the areas identified in the desktop review and site reconnaissance.

The presence/absence of wetlands was evaluated in accordance with the U.S. Army Corps of Engineers Wetlands Delineation Manual and the Northcentral and Northeastern Interim Regional Supplement. The targeted surveys consisted of traversing the landscape using a set of evenly spaced transects (approximately 50 to 100 m apart) in search of areas showing typical wetland characteristics. For an area to be identified as wetland it must show positive indicators in all three areas of assessment in a test pit location. The areas of assessment used were: hydrophytic vegetation, hydric soils and wetland hydrology.

### HYDROPHYTIC VEGETATION

As defined in the Corps Manual, hydrophytic vegetation is the community of macrophytes that occur in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to exert a controlling influence on the plant species present. The vegetation is assessed based on the indicator status of the dominant plant species in each strata (tree, shrub and herbaceous stratum). Indicator status varies from obligate (>99% of occurrences are in a wetland) to upland (<1% of occurrences are in a wetland). An assessment for hydrophytic vegetation is carried out at the wetland and upland test pit locations.

### HYDRIC SOILS

Hydric soils are soils that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper layers. Hydric soil indicators are formed predominantly by the accumulations or loss of iron, manganese, sulphur, or carbon compounds in a saturated and anaerobic environment. Examples of hydric soils include organic deposits caused by the accumulation of organic matter (lack of oxygen preventing decomposition) and mineral soils with gleyed or depleted matrices (soils stripped of iron and manganese). Soil profiles are observed in any suspected wetland, and the presence or absence of a positive indicator for hydric soils is noted. The soil profile is also observed at the upland test pit location to help determine the boundary location.

## WETLAND HYDROLOGY

A site is considered to show a positive indicator for wetland hydrology when either one primary indicator or two secondary indicators are observed. Common primary and secondary indicators are listed below:

### Primary Indicators

- Surface water, high water table, saturation
- Water marks on trees
- Sediment deposits
- Water-stained leaves
- Drift deposits

### Secondary Indicators

- Drainage patterns
- Stunted or stressed plants
- Dry-season water table

Vegetation was identified using the Flora of New Brunswick (Hinds, 2000) and then compared to the Nova Scotia Wetland Indicator Plant List (NSE, 2012). The Munsell Soil Color Charts (Munsell Color, 2009) and the Northeastern US Hydric Soil Indicators with Probable Application in Nova Scotia (Adapted from: Regional Supplement to the Corps of Engineers Wetland Delineation Manual Northcentral and Northeast Region. Version 2.0, 2012) were utilized in the identification of hydric soils. The soil in the subject property was sampled using a hand-held auger.

## 1.2.2 WETLAND DELINEATION

Once a wetland was identified, an upland test pit location was selected and evaluated for the same criteria. A wetland boundary was determined between the upland and wetland test pit locations; this boundary was then extended around the exterior of the wetland. Wetland data and boundary points were recorded using a Differential GPS system, which has an accuracy of one to two metres depending on tree cover. When necessary, additional soil probes were observed to confirm the boundary.

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## 1.3 RESULTS

Twenty five (25) wetland areas were identified and assessed during the site survey as shown in Appendix A, Figure 1. Of these, three (3) were identified as marsh, ten (10) as swamp, eleven (11) as marsh/swamp complexes and one (1) as a marsh/saltmarsh complex. The total wetland area delineated in the project area is approximately 86.24 hectares (ha) which represent 15.8% of the total project area (PA) (approximately 545.04 ha).

A brief description of each wetland identified at the BHEFT is available below. Figure 2, Appendix A identifies the classification type for each wetland identified with Figure 3, Appendix A, showing the soil type classification. Site photos are included in Appendix B, and wetland delineation data sheets are located in Appendix C. Figure 4, Appendix A, shows the paired pit location for each wetland identified and delineated.

**WL-1** is classified as a marsh in the western section of the PA, which is found on the fringe of the Boat Harbour Stabilization Lagoon, and has an approximate area of 0.52 ha. According to the Canadian Wetland Classification System (CWCS), marshes are defined as wetlands that are dominated by herbaceous vegetation rather than woody plant species and can often be found at the edge of lakes or streams, where they form a transition between aquatic and terrestrial habitat. The dominant tree stratum is Grey Birch (*Betula populifolia*) with Speckled Alder (*Alnus incana*) and Sweet Gale (*Myrica gale*) dominating shrub/sapling stratum along the edges of the wetland. The dominant species in the herbaceous layer is Cattails (*Typha sp.*) with minor amounts of Bluejoint Grass (*Calamagrostis canadensis*) closer to the wetland edge. The soil profile of this wetland was rich in organics with

little soil development. These properties are indicative of hydric conditions and are classified as A1-Histosols. Positive indicators of for wetland hydrology included high water table, saturation and presence of surface water.

**WL-2abc** are classified as swamp/marsh complexes found along the southwestern cove of the Boat Harbour Stabilization Lagoon, and have a combined approximate area of 1.90 ha. Swamps are forested or wooded wetlands and peatlands according to the Canadian Wetland Classification System (CWCS). The typical features of a swamp are the dominance of woody vegetation and wood-rich peat laid down by this vegetation. The dominant tree stratum in the swamp portion of these wetlands are Red Maple (*Acer rubrum*) and Balsam Fir (*Abies balsamea*), with Red Maple saplings, dominating the sapling/shrub stratum and Cinnamon Fern (*Osmunda cinnamomea*) dominating the herbaceous layer. Within the marsh area there is no tree or sapling/shrub stratum. The dominant species in the herbaceous layer is Cattails with minor amounts of Bluejoint Grass closer to the wetland edge. The hydric soil indicator of these wetlands is A11-Depleted Below Dark Surface. Positive indicators for wetland hydrology included soil saturation, stunted or stressed plants, drainage patterns, and micro-topographic relief.

**WL-3** is classified as a swamp found in the southern section of the PA, and has an approximate area of 0.45 ha. The dominant tree stratum in this wetland are Red Maple and Grey Birch. Dominant sapling/shrub stratum species are Grey Birch and Wild Raisin (*Viburnum nudum*) with Sensitive Fern (*Onoclea sensibilis*), and Bulrush (*Scirpus* spp.) dominating the herbaceous vegetation. The hydric soil indicator of this wetland is F3- Depleted Matrix. Positive indicators for wetland hydrology included high water table, saturation, water marks, sparsely vegetated concave surface, and water stained leaves.

**WL-4** is classified as a swamp/marsh complex, found in the southern section of the PA, and has an approximate area of 0.14 ha. A watercourse (WC-1) is associated with this wetland, and runs through the wetland in a northerly direction. In the swamp portion of the wetland, Grey Birch is the dominant species in the tree stratum in this wetland was (*Betula populifolia*) with Dwarf Raspberry (*Rubus pubescens*), Rough-Stemmed Goldenrod (*Solidago rugosa*), and Three-Seeded Sedge (*Carex Trisperma*) dominating the understory. In the marsh area there are snags with Cattails, Bluejoint Grass and Burreed (*Sparganium* sp.) dominating the herbaceous layer. The hydric soil indicator of this wetland is F3- Depleted Matrix with an A4- Hydrogen Sulfide odour (rotten eggs) odour. Positive indicators for wetland hydrology included saturation and presence of reduced iron.

**WL-5ab** are classified as swamp/marsh complexes found in the southern section of the PA, and have a combined approximate area of 0.15 ha. A watercourse (WC-1) is associated with these wetlands and runs in a northerly direction. In the marsh area there are snags with the herbaceous layer dominated by Rice Cutgrass, with pockets of Cattails, (*Leersia oryzoides*), pockets of various Sedges (*Carex* sp.) and pockets of Burreed depending on the depth of water. In the swamp, the treed stratum is dominated by Red Maple, and Speckled Alder in the sapling/shrub layer. The hydric soil indicator of this wetland is F3- Depleted Matrix with an A4- Hydrogen Sulfide odour (rotten eggs). Positive indicators of wetland hydrology included high water table, and saturation. WL-5b is the leachate collection system overflow pond for the existing landfill site.

**WL-6** is classified as a swamp found in the southern section of the PA, and has an approximate area of 1.05 ha in the study area, however this wetland extends beyond the project boundary for an unknown distance. Dominant tree stratum in this wetland are Grey Birch and Red Maple. Dominant shrub/sapling stratum are Rhodora (*Rhododendron canadense*), Mountain Holly (*Nemopanthus myronatus*), and Winterberry (*Ilex verticillata*). Dominant herbaceous species are Cinnamon Fern and Sensitive Fern. The hydric soil indicator for this wetland is A12- Thick Dark Surface. Positive indicators of wetland hydrology included high water table (~40cm below surface), and saturation.

**WL-7** is classified as a swamp/marsh complex found in the central section of the PA, and has an approximate area of 1.93 ha. In the swamp portion of the wetland, the dominant tree species are Grey Birch, and Red Maple, with Black Huckleberry (*Gaylussacia baccata*) dominating the shrub/ sapling stratum. Within the marsh portion of the wetland, Cattails dominate the herbaceous stratum. The hydric soil indicator for this wetland is F3-Depleted Matrix, with an A4-Hydrogen Sulfide odour. Positive indicators of wetland hydrology included high water table, surface water, and soil saturation.

**WL-8** is classified as a swamp found in the southern section of the PA, and has an approximate area of 0.87 ha. Dominant tree stratum in this wetland is Balsam Fir with Speckled Alder dominating the shrub sapling stratum. Dominant species in the herbaceous stratum are Cinnamon Fern and Sensitive Fern. The hydric soil indicator of this wetland is F6-Redox Dark Surface. Wetland hydrology indicators included water marks, sediment deposits, water stained leaves, aquatic fauna, and moss trim lines.

**WL-9** is classified as a swamp found in the southern section of the PA, and has an approximate area of 0.13 ha. A watercourse (WC-2) is associated with this wetland, and flows in a westerly direction. Dominant tree stratum in this wetland are Grey Birch and Red Maple with Speckled Alder dominating the shrub sapling stratum. Dominant herbaceous species is Sensitive Fern. The hydric soil indicator of this wetland is A12-Thick Dark Surface. Positive wetland hydrology indicators included surface water, high water table, saturation, water marks, water stained leaves, and aquatic fauna.

**WL-10** is classified as a swamp/marsh complex found in the southern section of the PA, and has an approximate area of 2.18 ha. Two watercourses are associated with this wetland, with WC-5 flowing into the wetland, and the headwaters of WC-6 flowing out of this wetland. The dominant tree stratum in the swamp portion of the wetland are Red Maple and Balsam Fir with Speckled Alder dominating the shrub sapling stratum. The dominant herbaceous species are Cinnamon Fern and Sensitive Fern. In the marsh portion of the wetland, Cattails and Pondweed (*Potamogeton sp.*) dominate the herbaceous stratum. The hydric soil indicator is F3- Depleted Matrix. Positive wetland hydrology indicators high water table and soil saturation.

**WL-11** is classified as a swamp found in the southwestern section of the PA, and has an approximate area of 0.92 ha. A watercourse (WC-7) is associated with this wetland, and flowed in a north-easterly direction. The dominant species in the tree stratum is Red Maple, with Speckled Alder and Red Maple saplings dominating the sapling/shrub stratum. The dominant herbaceous species is Sensitive Fern. The hydric soil indicator is F3- Depleted Matrix, and the wetland hydrology indicators for this wetland are saturation, sediment deposits, water stained leaves, and moss trim lines.

**WL-12** is classified as a swamp found in the western section of the PA, and has an approximate area of 0.48 ha. The dominant tree species in this wetland are Red Maple and Balsam Fir with Winterberry dominating the shrub/sapling stratum. The dominant herbaceous species is Meadow Sedge (*Carex granularis*). The hydric soil indicator for this wetland is F3- Depleted Matrix. The wetland hydrology indicators included saturation, water marks, and sediment deposits.

**WL-13abc** are classified as swamp/marsh complexes found in the western section of the PA, and have a combined approximate area of 36.62 ha. The swamp portion of this wetland complex is dominated by Red Maple in the tree stratum and Speckled Alder in the shrub/sapling stratum. The dominant herbaceous species are Cinnamon Fern and Sensitive Fern. In the marsh portion of the wetland, Cattails are the dominant herbaceous species. The hydric soil indicator for this wetland is S9- Thin Dark Surface, with an A4-Hydrogen Sulfide odour. Wetland hydrology indicators include surface water, high water table, and saturation. This wetland was previously used as a settling pond for effluent, and is known to contain residual chemicals or elements that could potentially effect the wetland's function.

**WL-14** is classified as a swamp found in the central section of the PA, and has an approximate area of 0.14 ha. The dominant tree species in this wetland are Balsam Fir and Red Maple, with Mountain Holly dominating the shrub/sapling stratum. Cinnamon Fern is the dominant herbaceous species. The hydric soil indicator is A2-Histic Epipedon, with saturation as the primary wetland hydrology indicator.

**WL-15** is classified as a marsh found in the northwestern section of the PA, and has an approximate area of 0.60 ha. Dominant tree stratum at this site are Balsam Fir and Red Maple with Black Huckleberry as the dominant sapling/shrub species. The dominant herbaceous species in this wetland are American Burr-reed (*Sparganium americanum*), and Devil's Beggartick (*Bidens frondosa*). The hydric soil indicator in this wetland is S4- Sandy Gleyed Matrix. The wetland hydrology indicators include high water table, surface water, and saturation. This wetland is found adjacent to a former settling pond, with a man-made berm separating the two. As such, this wetland may contain contaminants from the near-by former settling pond.

**WL-16** is classified as a marsh found in the northwestern section of the PA, and has an approximate area of 15.61 ha. Along the perimeter of the marsh, the dominant tree species are were Red Maple and Balsam Fir and the dominant sapling/shrub species are Grey Birch, and Steeplebush (*Spiraea tomentosa*). Cattails are the dominant herbaceous species. The hydric soil indicator is F3-Depleted Matrix, with the presence of surface water, and high water table the primary wetland hydrology indicators. This wetland was previously used as a settling pond for effluent, and is known to contain residual chemicals or elements that could potentially effect the wetland's function.

**WL-17** is classified as a swamp found in the northwestern section of the PA, and has an approximate area of 1.03 ha. A watercourse (WC-10) was found near the southern edge of this wetland, and runs in a southerly direction. The dominant species in the tree stratum is Red Maple and Balsam Fir with Balsam Fir saplings dominating the sapling/shrub stratum. The dominant herbaceous species are Cinnamon Fern, Sensitive Fern and Creeping Buttercup (*Ranunculus repens*). The hydric soil indicator for this wetland is F2- Loamy Gleyed Matrix, with saturation as the primary wetland hydrology indicator.

**WL-18abc** are classified as swamp/marsh complexes found bordering the Boat Harbour Stabilization Lagoon in the northwestern section of the PA, these wetlands have a combined approximate area of 2.69 ha. A watercourse (WC-13) is associated with this wetland, and runs in a southeasterly direction. Dominant tree stratum were Red Maple (*Acer rubrum*). In the swamp portion of the wetland, the dominant tree species is Red Maple with Speckled Alder and Wild Raisin dominating the sapling/shrub stratum, and Cinnamon Fern the herbaceous stratum. In the marsh portion of the wetland, Cattails are the dominant herbaceous species. The hydric soil indicator is A11- Depleted Below Dark Surface, with a high water table, and saturation as the primary wetland hydrology indicators.

**WL-19** is classified as a swamp found in the northern section of the PA, and has an approximate area of 0.093 ha. The dominant tree species is Red Maple with Winterberry Dominating the shrub/sapling stratum. Cinnamon Fern is the dominant herbaceous species. The hydric soil indicator is an A1-Histosol. The wetland hydrology indicators included high water table, saturation, water marks, stained leaves, and moss trim lines.

**WL-20abcd** are classified as swamp/marsh complexes found on the fringe of the Boat Harbour Stabilization Lagoon in the northern section of the PA, and have a combined approximate area of 2.88 ha. An ephemeral watercourse (WC-14) is associated with this wetland is found on the wetland's northern edge, and flows in a southerly direction. Within the swamp portion of the wetland areas, Grey Birch is the predominant tree species and sapling/shrub stratum, and Sensitive Fern is the dominant herbaceous species. Within the marsh portion of the wetland, Cattails are the predominant herbaceous species. The hydric soil indicator is F3- Depleted Matrix, and the wetland hydrology indicators include high water table, saturation, sediment deposits, water stained leaves, and drainage patterns.

**WL-21** is classified as a swamp found in the northern section of the PA, and has an approximate area of 0.057 ha. Red Maple is the dominant tree species with Red Maple and Balsam Fir saplings dominating the shrub/sapling stratum. The herbaceous stratum is dominated with Cinnamon Fern and Sensitive Fern. The hydric soil indicator for this wetland is S5-Sandy Redox. The wetland hydrology indicators are saturation, sediment deposits, water stained leaves, drainage patterns, and moss trim lines.

**WL-22ab** are classified as marsh/ saltmarsh complexes found in the northern-most section of the PA, have a combined approximate area of 10.02 ha. There are no species identified in the tree or shrub stratum in either the freshwater marsh or saltmarsh portions of this wetland complex. Within the freshwater marsh Cattails and Hedge Bindweed (*Calystegia sepium*) are the dominant species while in the saltmarsh, Smooth Cordgrass (*Spartina alterniflora*) is the dominant herbaceous species. The hydric soil indicator is A1-Histosol, and the wetland hydrology indicators include surface water, high water table, saturation, algal mat or crust, and hydrogen sulfide odour.

**WL-23abc** are classified as swamp/marsh complexes found in the eastern section of the PA, and have a combined approximate area of 1.37 ha. Two watercourses (WC-17 & WC-18) are associated with these wetlands, and both run in a northwesterly direction. Within the swamp portion of the wetland, the dominant tree species are Grey Birch and Red Maple with the sapling/shrub stratum dominated by Grey Birch saplings and Speckled Alder. Within the marsh portion of the wetland the dominant herbaceous species are Cattail and Common Rush (*Juncus effuses*). The hydric soil indicator for this wetland is A3-Black Histic, with an A4- Hydrogen Sulfide odour. The wetland hydrology indicators include surface water, high water table, saturation, water marks, sediment deposits, aquatic fauna, and hydrogen sulfide odour.

**WL-24** is classified as a swamp/marsh complex found in the south eastern section of the PA, and has an approximate area of 0.45 ha. A watercourse (WC-19) is associated with this watercourse, and runs in a northwesterly direction. Within the swamp portion of the wetland, Grey Birch is the dominant tree species were, with Grey Birch saplings and Speckled Alder dominating the sapling/shrub stratum. Within the marsh portion of the wetland, the dominant herbaceous species are Cattail and Bulrush (*Scirpus sp.*). The soil is considered to be a

problematic soil and has an indicator of S3- 5cm of Mucky Peat or Peat, with an A4-Hydrogen Sulfide odour. The wetland hydrology indicators include surface water, high water table, saturation, hydrogen sulfide odours, and oxidized rhizospheres on living roots.

**WL-25** is classified as a swamp found along the effluent line corridor and has an approximate area of 0.057 ha. There are no living trees located within the wetland. The sapling/shrub stratum is dominated by Winterberry with the herbaceous stratum dominated by Cinnamon Fern and Sensitive Fern. The hydric soil indicator is A1- Histosol, and the wetland hydrology indicators are surface water, high water table, saturation, and water stained leaves.

# 2 WETLAND FUNCTIONAL ASSESSMENT

## 2.1 METHODOLOGY

Wetland functional assessments were carried out on site between August and November, 2017. A functional assessment for each wetland was completed using the Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC Version 1.2.1, October 2017), which is a combined desktop and field evaluation method designed to assess the condition and function of Nova Scotia’s wetlands. WESP-AC generates scores (0 to 10) and ratings (Lower, Moderate, and Higher) for each of a wetland’s functions and benefits. This is done in a consistent and transparent manner so that the scores and ratings can be used to make informed decisions about wetland avoidance, minimisation and replacement. It can also help to ensure that wetland restoration balances unavoidable loss of specific functions and benefits (NBDELG, 2017). Table 2.1, extracted from NBDELG, 2017, describes the wetlands functions and their benefits that are measured by the WESP-AC.

**Table 2.1: Benefits of Wetland Functions Scored by WESP-AC**

FUNCTION	DEFINITION	POTENTIAL BENEFITS
<b>Hydrologic Functions:</b>		
Water Storage & Delay	The effectiveness for storing runoff or delaying the downslope movement of surface water for long or short periods.	Flood control, maintain ecological systems.
Stream Flow Support	The effectiveness for contributing water to streams especially during the driest part of a growing season.	Support fish and other aquatic life.
<b>Water Quality Maintenance Functions:</b>		
Water Cooling	The effectiveness for maintaining or reducing temperature of downslope waters.	Support coldwater fish and other aquatic life.
Sediment Retention & Stabilization	The effectiveness for intercepting and filtering suspended inorganic sediments thus allowing their deposition, as well as reducing energy of waves and currents, resisting excessive erosion, and stabilising underlying sediments or soil.	Maintain quality of receiving waters. Protect shoreline structures from erosion.
Phosphorus Retention	The effectiveness for retaining phosphorus for long periods (>1 growing season).	Maintain quality of receiving waters.

FUNCTION	DEFINITION	POTENTIAL BENEFITS
Nitrate Removal & Retention	The effectiveness for retaining particulate nitrate and converting soluble nitrate and ammonium to nitrogen gas while generating little or no nitrous oxide (a potent greenhouse gas).	Maintain quality of receiving waters.
Carbon Sequestration	The effectiveness of a wetland both for retaining incoming particulate and dissolved carbon, and through the photosynthetic process, converting carbon dioxide gas to organic matter (particulate or dissolved). And to then retain that organic matter on a net annual basis for long periods while emitting little or no methane (a potent greenhouse gas).	Maintain quality of receiving waters.
Organic Nutrient Export	The effectiveness for producing and subsequently exporting organic nutrients (mainly carbon), either particulate or dissolved.	Support food chains in receiving waters.
<b>Ecological Habitat Functions:</b>		
Fish Habitat	The capacity to support an abundance and diversity of native fish (both anadromous and resident species).	Support recreational and ecological values
Aquatic Invertebrate Habitat	The capacity to support or contribute to an abundance or diversity of invertebrate animals which spend all or part of their life cycle underwater or in moist soil. Includes dragonflies, midges, clams, snails, water beetles, shrimp, aquatic worms, and others.	Support salmon and other aquatic life. Maintain regional biodiversity.
Amphibian & Reptile Habitat	The capacity to support or contribute to an abundance or diversity of native frogs, toads, salamanders, and turtles.	Maintain regional biodiversity.
Waterbird Feeding Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds that migrate or winter but do not breed in the region.	The capacity to support or contribute to an abundance or diversity of waterbirds that migrate or winter but do not breed in the region.
Waterbird Nesting Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds that nest in the region.	Maintain regional biodiversity.

FUNCTION	DEFINITION	POTENTIAL BENEFITS
Songbird, Raptor, & Mammal Habitat	The capacity to support or contribute to an abundance or diversity of native songbird, raptor, and mammal species and functional groups, especially those that are most dependent on wetlands or water.	Maintain regional biodiversity.
Native Plant and Pollinator Habitat	The capacity to support or contribute to a diversity of native, hydrophytic, vascular plant species, communities, and/or functional groups, as well as the pollinating insects linked to them.	Maintain regional biodiversity and food chains.
Public Use & Recognition*	Prior designation of the wetland, by a natural resource or environmental agency, as some type of special protected area. Also, the potential and actual use of a wetland for low-intensity outdoor recreation, education, or research.	Commercial and social benefits of recreation. Protection of prior public investments.
* a benefit rather than a function of wetlands		

## 2.2 RESULTS

The findings of the WESP-AC for Wetlands 1 to 25 are summarized in Table 2.2, Table 2.3 and Table 2.4 below. Table 2.2 and Table 2.3 summarize the results for the non-tidal wetlands, and Table 2.4 summarizes the results for the tidal portion of WL22. For further details refer to the WESP-AC data forms in Appendix D.

With the abundance of wetland area within the PA, and the wide range of wetland sizes encountered, it is difficult to pin-point definitive trends or parameters that are uniform throughout the site. Most of the wetlands in the PA have a moderate or high value pertaining to sediment retention, and all wetlands on site have low potential for anadromous fish habitat. After review of the wetland grouped function tables it is possible to generalize the wetland scores as follows:

- Hydrologic group function – Mostly Lower
- Water quality support group – Mostly Moderate or Higher
- Aquatic support group – Mostly Moderate
- Aquatic habitat group – Mostly Moderate or Higher
- Transition habitat group – Mostly Moderate or Higher
- Wetland Condition – Mostly Moderate
- Wetland Risk – Mostly Moderate or Higher

This data concludes that most of the wetlands at the BHETF are in a moderate condition but are moderately or highly prone to degradation due to their risk score, which is an average of the wetland’s stress and sensitivity scores. The hydrologic functions of these wetlands are considered lower, and as many of the wetlands are associated with a watercourse, the generalized score for aquatic habitat was mostly moderate or higher. Scores were considered moderate or higher in the transition habitat group, meaning they provide support or contribute to a diversity of native birds, mammals, vascular plants, and pollinating insects.

**Table 2.2: Non-Tidal Wetland WESP-AC Function Scores**

Wetland Functions or Other Attributes	WL-1		WL-2abc		WL-3		WL-4	
	Function Rating	Benefits Rating						
Water Storage & Delay (WS)	Lower	Lower	Higher	Lower	Higher	Lower	Moderate	Lower
Stream Flow Support (SFS)	Moderate	Moderate	Lower	Lower	Lower	Lower	Lower	Lower
Water Cooling (WC)	Higher	Lower	Higher	Lower	Lower	Lower	Moderate	Lower
Sediment Retention & Stabilization (SR)	Lower	Higher	Higher	Higher	Higher	Higher	Moderate	Higher
Phosphorus Retention (PR)	Lower	Higher	Higher	Higher	Moderate	Higher	Lower	Higher
Nitrate Removal & Retention (NR)	Lower	Higher	Higher	Higher	Higher	Higher	Moderate	Higher
Carbon Sequestration (CS)	Moderate	-	Higher	-	Higher	-	Moderate	-
Organic Nutrient Export (OE)	Higher	-	Lower	-	Lower	-	Moderate	-
Anadromous Fish Habitat (FA)	Lower							
Resident Fish Habitat (FR)	Lower	Lower	Lower	Lower	Lower	Lower	Moderate	Moderate
Aquatic Invertebrate Habitat (INV)	Moderate	Moderate	Higher	Moderate	Higher	Moderate	Higher	Higher
Amphibian & Turtle Habitat (AM)	Higher	Moderate	Moderate	Higher	Moderate	Moderate	Higher	Higher
Waterbird Feeding Habitat (WBF)	Higher	Moderate	Higher	Moderate	Lower	Lower	Higher	Moderate
Waterbird Nesting Habitat (WBN)	Higher	Moderate	Moderate	Moderate	Lower	Lower	Higher	Moderate
Songbird, Raptor, & Mammal Habitat (SBM)	Moderate	Moderate	Higher	Moderate	Moderate	Moderate	Higher	Moderate
Pollinator Habitat (POL)	Moderate	Moderate	Higher	Moderate	Moderate	Moderate	Higher	Moderate
Native Plant Habitat (PH)	Lower	Moderate	Moderate	Higher	Lower	Moderate	Moderate	Higher
Public Use & Recognition (PU)	-	Moderate	-	Moderate	-	Lower	-	Lower
Wetland Sensitivity (Sens)	-	Lower	-	Higher	-	Moderate	-	Moderate
Wetland Ecological Condition (EC)	-	Moderate	-	Moderate	-	Moderate	-	Moderate
Wetland Stressors (STR)*	-	Higher	-	Higher	-	Lower	-	Moderate

\*higher score means more stress

**Table 2.2: Non-Tidal Wetland WESP-AC Function Scores (Continued)**

Wetland Functions or Other Attributes	WL-5ab		WL-6		WL-7		WL-8	
	Function Rating	Benefits Rating						
Water Storage & Delay (WS)	Lower	Lower	Higher	Lower	Higher	Lower	Lower	Lower
Stream Flow Support (SFS)	Moderate	Moderate	Lower	Lower	Lower	Lower	Lower	Moderate
Water Cooling (WC)	Lower	Lower	Lower	Lower	Lower	Lower	Higher	Lower
Sediment Retention & Stabilization (SR)	Moderate	Higher	Higher	Higher	Higher	Higher	Moderate	Higher
Phosphorus Retention (PR)	Moderate	Higher	Higher	Higher	Higher	Higher	Moderate	Higher
Nitrate Removal & Retention (NR)	Lower	Higher	Higher	Higher	Higher	Higher	Lower	Higher
Carbon Sequestration (CS)	Moderate	-	Moderate	-	Moderate	-	Higher	-
Organic Nutrient Export (OE)	Moderate	-	Lower	-	Lower	-	Higher	-
Anadromous Fish Habitat (FA)	Lower							
Resident Fish Habitat (FR)	Higher	Moderate	Lower	Lower	Lower	Lower	Lower	Lower
Aquatic Invertebrate Habitat (INV)	Higher	Higher	Lower	Moderate	Moderate	Moderate	Higher	Moderate
Amphibian & Turtle Habitat (AM)	Higher	Higher	Moderate	Moderate	Higher	Moderate	Moderate	Moderate
Waterbird Feeding Habitat (WBF)	Higher	Higher	Moderate	Moderate	Higher	Moderate	Higher	Moderate
Waterbird Nesting Habitat (WBN)	Higher	Higher	Moderate	Lower	Higher	Moderate	Moderate	Moderate
Songbird, Raptor, & Mammal Habitat (SBM)	Higher	Higher	Higher	Lower	Moderate	Moderate	Higher	Moderate
Pollinator Habitat (POL)	Higher	Higher	Higher	Lower	Higher	Lower	Higher	Lower
Native Plant Habitat (PH)	Higher	Higher	Moderate	Moderate	Lower	Moderate	Higher	Moderate
Public Use & Recognition (PU)	-	Lower	-	Lower	-	Lower	-	Lower
Wetland Sensitivity (Sens)	-	Lower	-	Moderate	-	Moderate	-	Higher
Wetland Ecological Condition (EC)	-	Higher	-	Moderate	-	Moderate	-	Higher
Wetland Stressors (STR)*	-	Moderate	-	Higher	-	Higher	-	Higher

\*higher score means more stress

**Table 2.2: Non-Tidal Wetland WESP-AC Function Scores (Continued)**

Wetland Functions or Other Attributes	WL-9		WL-10		WL-11		WL-12	
	Function Rating	Benefits Rating						
Water Storage & Delay (WS)	Moderate	Lower	Lower	Lower	Lower	Lower	Higher	Lower
Stream Flow Support (SFS)	Lower	Lower	Higher	Moderate	Moderate	Moderate	Lower	Lower
Water Cooling (WC)	Moderate	Lower	Higher	Moderate	Moderate	Lower	Lower	Lower
Sediment Retention & Stabilization (SR)	Lower	Higher	Lower	Higher	Lower	Lower	Higher	Higher
Phosphorus Retention (PR)	Lower	Higher	Moderate	Higher	Moderate	Moderate	Higher	Higher
Nitrate Removal & Retention (NR)	Lower	Higher	Lower	Higher	Lower	Higher	Higher	Higher
Carbon Sequestration (CS)	Moderate	-	Lower	-	Moderate	-	Moderate	-
Organic Nutrient Export (OE)	Moderate	-	Higher	-	Higher	-	Lower	-
Anadromous Fish Habitat (FA)	Lower							
Resident Fish Habitat (FR)	Lower	Lower	Higher	Moderate	Lower	Lower	Lower	Lower
Aquatic Invertebrate Habitat (INV)	Moderate	Moderate	Moderate	Higher	Moderate	Moderate	Lower	Moderate
Amphibian & Turtle Habitat (AM)	Higher	Moderate	Higher	Moderate	Lower	Lower	Moderate	Moderate
Waterbird Feeding Habitat (WBF)	Moderate	Moderate	Higher	Moderate	Lower	Lower	Moderate	Moderate
Waterbird Nesting Habitat (WBN)	Higher	Moderate	Higher	Moderate	Lower	Lower	Moderate	Moderate
Songbird, Raptor, & Mammal Habitat (SBM)	Moderate	Moderate	Higher	Moderate	Higher	Moderate	Higher	Moderate
Pollinator Habitat (POL)	Moderate	Lower	Moderate	Lower	Higher	Moderate	Higher	Lower
Native Plant Habitat (PH)	Moderate	Moderate	Higher	Moderate	Higher	Higher	Higher	Moderate
Public Use & Recognition (PU)	-	Lower	-	Moderate	-	Lower	-	Lower
Wetland Sensitivity (Sens)	-	Moderate	-	Higher	-	Higher	-	Higher
Wetland Ecological Condition (EC)	-	Moderate	-	Moderate	-	Moderate	-	Higher
Wetland Stressors (STR)*	-	Higher	-	Higher	-	Higher	-	Moderate

\*higher score means more stress

**Table 2.2: Non-Tidal Wetland WESP-AC Function Scores (Continued)**

Wetland Functions or Other Attributes	WL-13abc		WL-14		WL-15		WL-16	
	Function Rating	Benefits Rating						
Water Storage & Delay (WS)	Lower	Lower	Higher	Lower	Moderate	Lower	Lower	Lower
Stream Flow Support (SFS)	Moderate	Moderate	Lower	Lower	Lower	Moderate	Moderate	Moderate
Water Cooling (WC)	Lower	Moderate	Lower	Lower	Lower	Lower	Moderate	Moderate
Sediment Retention & Stabilization (SR)	Moderate	Higher	Higher	Higher	Moderate	Higher	Moderate	Higher
Phosphorus Retention (PR)	Moderate	Higher	Higher	Higher	Lower	Higher	Moderate	Higher
Nitrate Removal & Retention (NR)	Lower	Higher	Higher	Higher	Moderate	Lower	Lower	Higher
Carbon Sequestration (CS)	Moderate	-	Lower	-	Moderate	-	Moderate	-
Organic Nutrient Export (OE)	Moderate	-	Lower	-	Moderate	-	Moderate	-
Anadromous Fish Habitat (FA)	Lower							
Resident Fish Habitat (FR)	Higher	Moderate	Lower	Lower	Higher	Moderate	Higher	Moderate
Aquatic Invertebrate Habitat (INV)	Higher	Higher	Lower	Moderate	Moderate	Higher	Higher	Higher
Amphibian & Turtle Habitat (AM)	Higher	Higher	Lower	Moderate	Higher	Moderate	Higher	Higher
Waterbird Feeding Habitat (WBF)	Higher	Moderate	Moderate	Moderate	Higher	Moderate	Higher	Moderate
Waterbird Nesting Habitat (WBN)	Higher	Moderate	Moderate	Moderate	Higher	Lower	Higher	Moderate
Songbird, Raptor, & Mammal Habitat (SBM)	Higher	Moderate	Higher	Moderate	Higher	Lower	Higher	Moderate
Pollinator Habitat (POL)	Higher	Lower	Higher	Lower	Moderate	Lower	Moderate	Moderate
Native Plant Habitat (PH)	Higher	Moderate	Lower	Moderate	Moderate	Moderate	Higher	Higher
Public Use & Recognition (PU)	-	Lower	-	Lower	-	Moderate	-	Lower
Wetland Sensitivity (Sens)	-	Moderate	-	Moderate	-	Moderate	-	Lower
Wetland Ecological Condition (EC)	-	Higher	-	Higher	-	Moderate	-	Moderate
Wetland Stressors (STR)*	-	Higher	-	Moderate	-	Moderate	-	Higher

\*higher score means more stress

**Table 2.2: Non-Tidal Wetland WESP-AC Function Scores (Continued)**

Wetland Functions or Other Attributes	WL-17		WL-18abc		WL-19		WL-20abcd	
	Function Rating	Benefits Rating						
Water Storage & Delay (WS)	Moderate	Lower	Higher	Lower	Higher	Lower	Moderate	Lower
Stream Flow Support (SFS)	Moderate	Moderate	Lower	Lower	Lower	Lower	Moderate	Moderate
Water Cooling (WC)	Higher	Lower	Higher	Lower	Lower	Lower	Higher	Moderate
Sediment Retention & Stabilization (SR)	Moderate	Higher	Moderate	Higher	Higher	Higher	Moderate	Higher
Phosphorus Retention (PR)	Lower	Higher	Moderate	Higher	Higher	Higher	Moderate	Higher
Nitrate Removal & Retention (NR)	Moderate	Higher						
Carbon Sequestration (CS)	Higher	-	Lower	-	Lower	-	Moderate	-
Organic Nutrient Export (OE)	Moderate	-	Moderate	-	Lower	-	Higher	-
Anadromous Fish Habitat (FA)	Lower							
Resident Fish Habitat (FR)	Lower	Lower	Moderate	Higher	Lower	Lower	Higher	Higher
Aquatic Invertebrate Habitat (INV)	Moderate	Moderate	Moderate	Moderate	Lower	Moderate	Higher	Higher
Amphibian & Turtle Habitat (AM)	Higher	Moderate	Moderate	Moderate	Moderate	Moderate	Higher	Higher
Waterbird Feeding Habitat (WBF)	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Higher	Moderate
Waterbird Nesting Habitat (WBN)	Moderate	Moderate	Moderate	Lower	Lower	Moderate	Higher	Lower
Songbird, Raptor, & Mammal Habitat (SBM)	Higher	Moderate	Higher	Lower	Moderate	Moderate	Higher	Lower
Pollinator Habitat (POL)	Higher	Lower	Higher	Lower	Moderate	Lower	Higher	Lower
Native Plant Habitat (PH)	Lower	Moderate	Moderate	Moderate	Lower	Moderate	Higher	Moderate
Public Use & Recognition (PU)	-	Lower	-	Moderate	-	Lower	-	Higher
Wetland Sensitivity (Sens)	-	Moderate	-	Higher	-	Lower	-	Moderate
Wetland Ecological Condition (EC)	-	Moderate	-	Moderate	-	Lower	-	Moderate
Wetland Stressors (STR)*	-	Lower	-	Higher	-	Higher	-	Moderate

\*higher score means more stress

**Table 2.2: Non-Tidal Wetland WESP-AC Function Scores (Continued)**

Wetland Functions or Other Attributes	WL-21		WL-22		WL-23ABC		WL-24		WL-25	
	Function Rating	Benefit Rating								
Water Storage & Delay (WS)	Higher	Lower	Lower	Moderate	Moderate	Lower	Lower	Lower	Higher	Lower
Stream Flow Support (SFS)	Lower	Lower	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Lower	Lower
Water Cooling (WC)	Moderate	Lower	Moderate	Moderate	Higher	Moderate	Moderate	Moderate	Moderate	Lower
Sediment Retention & Stabilization (SR)	Higher	Higher	Moderate	Higher	Moderate	Higher	Lower	Higher	Higher	Lower
Phosphorus Retention (PR)	Higher	Higher	Lower	Higher	Moderate	Higher	Lower	Higher	Higher	Lower
Nitrate Removal & Retention (NR)	Higher	Higher	Lower	Higher	Higher	Higher	Lower	Higher	Higher	Lower
Carbon Sequestration (CS)	Lower	-	Moderate	-	Moderate	-	Lower	-	Moderate	-
Organic Nutrient Export (OE)	Lower	-	Moderate	-	Higher	-	Moderate	-	Lower	-
Anadromous Fish Habitat (FA)	Lower	Lower								
Resident Fish Habitat (FR)	Lower	Lower	Higher	Higher	Higher	Higher	Higher	Moderate	Lower	Lower
Aquatic Invertebrate Habitat (INV)	Lower	Moderate	Higher	Higher	Higher	Higher	Moderate	Higher	Lower	Moderate
Amphibian & Turtle Habitat (AM)	Moderate	Moderate	Higher	Higher	Higher	Higher	Higher	Moderate	Moderate	Higher
Waterbird Feeding Habitat (WBF)	Moderate	Moderate	Higher	Moderate	Higher	Moderate	Higher	Moderate	Moderate	Moderate
Waterbird Nesting Habitat (WBN)	Moderate	Moderate	Higher	Moderate	Higher	Lower	Higher	Lower	Moderate	Moderate
Songbird, Raptor, & Mammal Habitat (SBM)	Moderate	Moderate	Moderate	Moderate	Higher	Lower	Higher	Lower	Higher	Moderate
Pollinator Habitat (POL)	Moderate	Lower	Moderate	Moderate	Higher	Lower	Moderate	Lower	Higher	Lower
Native Plant Habitat (PH)	Lower	Moderate	Lower	Moderate	Higher	Moderate	Moderate	Moderate	Higher	Moderate
Public Use & Recognition (PU)	-	Lower	-	Moderate	-	Higher	-	Lower	-	Lower
Wetland Sensitivity (Sens)	-	Higher	-	Moderate	-	Lower	-	Lower	-	Lower
Wetland Ecological Condition (EC)	-	Moderate	-	Lower	-	Moderate	-	Moderate	-	Moderate
Wetland Stressors (STR)*	-	Higher	-	Higher	-	Moderate	-	Lower	-	Lower

\*higher score means more stress

**Table 2.3: WESP- AC Summary Ratings for Grouped Functions, Wetland Condition and Wetland Risk of Non-Tidal Wetlands**

Wetland Functions or Other Attributes	WL-1		WL-2abc		WL-3		WL-4	
	Function Rating	Benefit Rating						
Hydrologic Group	Lower	Lower	Higher	Lower	Higher	Lower	Moderate	Lower
Water Quality Support Group	Lower	Higher	Higher	Higher	Higher	Higher	Moderate	Higher
Aquatic Support Group	Moderate	Moderate	Moderate	Moderate	Moderate	Lower	Moderate	Moderate
Aquatic Habitat Group	Higher	Moderate	Moderate	Higher	Lower	Moderate	Higher	Higher
Transition Habitat Group	Moderate	Lower	Higher	Moderate	Moderate	Lower	Higher	Moderate
Wetland Condition	-	Moderate	-	Moderate	-	Moderate	-	Moderate
Wetland Risk*	-	Moderate	-	Higher	-	Lower	-	Lower
Wetland Functions or Other Attributes	WL-5ab		WL-6		WL-7		WL-8	
	Function Rating	Benefit Rating						
Hydrologic Group	Lower	Lower	Higher	Lower	Higher	Lower	Lower	Lower
Water Quality Support Group	Moderate	Higher	Higher	Higher	Higher	Higher	Moderate	Higher
Aquatic Support Group	Higher	Moderate	Lower	Lower	Lower	Moderate	Higher	Moderate
Aquatic Habitat Group	Higher	Higher	Moderate	Moderate	Higher	Moderate	Moderate	Moderate
Transition Habitat Group	Higher	Higher	Higher	Lower	Moderate	Lower	Higher	Lower
Wetland Condition	-	Higher	-	Moderate	-	Moderate	-	Higher
Wetland Risk*	-	Lower	-	Moderate	-	Higher	-	Higher
Wetland Functions or Other Attributes	WL-9		WL-10		WL-11		WL-12	
	Function Rating	Benefit Rating						
Hydrologic Group	Moderate	Lower	Lower	Lower	Lower	Lower	Higher	Lower
Water Quality Support Group	Lower	Higher	Lower	Higher	Moderate	Lower	Higher	Higher
Aquatic Support Group	Moderate	Moderate	Higher	Moderate	Moderate	Lower	Lower	Lower
Aquatic Habitat Group	Higher	Moderate	Higher	Higher	Lower	Lower	Moderate	Moderate
Transition Habitat Group	Moderate	Lower	Moderate	Lower	Higher	Moderate	Higher	Lower
Wetland Condition	-	Moderate	-	Moderate	-	Moderate	-	Higher
Wetland Risk*	-	Higher	-	Higher	-	Higher	-	Moderate

\*average of sensitivity and stressors

**Table 2.3: WESP- AC Summary Ratings for Grouped Functions, Wetland Condition and Wetland Risk of Non-Tidal Wetlands (Continued)**

Wetland Functions or Other Attributes	WL-13abc		WL-14		WL-15		WL-16	
	Function Rating	Benefit Rating						
Hydrologic Group	Lower	Lower	Higher	Lower	Moderate	Lower	Lower	Lower
Water Quality Support Group	Lower	Higher	Higher	Higher	Lower	Higher	Moderate	Higher
Aquatic Support Group	Moderate	Moderate	Lower	Lower	Moderate	Moderate	Higher	Moderate
Aquatic Habitat Group	Higher	Higher	Lower	Moderate	Higher	Moderate	Higher	Higher
Transition Habitat Group	Higher	Lower	Moderate	Lower	Moderate	Lower	Moderate	Moderate
Wetland Condition	-	Higher	-	Higher	-	Moderate	-	Moderate
Wetland Risk*	-	Moderate	-	Moderate	-	Moderate	-	Moderate
Wetland Functions or Other Attributes	WL-17		WL-18abc		WL-19		WL-20abcd	
	Function Rating	Benefit Rating						
Hydrologic Group	Moderate	Lower	Higher	Lower	Higher	Lower	Moderate	Lower
Water Quality Support Group	Moderate	Higher	Higher	Higher	Higher	Higher	Moderate	Higher
Aquatic Support Group	Moderate	Moderate	Moderate	Moderate	Lower	Lower	Higher	Higher
Aquatic Habitat Group	Moderate	Moderate	Moderate	Higher	Moderate	Moderate	Higher	Higher
Transition Habitat Group	Higher	Lower	Moderate	Lower	Moderate	Lower	Higher	Lower
Wetland Condition	-	Moderate	-	Moderate	-	Lower	-	Moderate
Wetland Risk*	-	Lower	-	Higher	-	Moderate	-	Lower

**Table 2.3: WESP- AC Summary Ratings for Grouped Functions, Wetland Condition and Wetland Risk of Non-Tidal Wetlands (Continued)**

Wetland Functions or Other Attributes	WL-21		WL-22		Wetland 23abc		WL-24		WL-25	
	Function rating	Benefit Rating								
Hydrologic Group	Higher	Lower	Lower	Moderate	Moderate	Lower	Lower	Lower	Higher	Lower
Water Quality Support Group	Higher	Higher	Lower	Higher	Moderate	Higher	Lower	Higher	Higher	Lower
Aquatic Support Group	Lower	Lower	Higher	Moderate	Higher	Higher	Moderate	Moderate	Lower	Lower
Aquatic Habitat Group	Moderate	Moderate	Higher	Higher	Higher	Higher	Higher	Moderate	Moderate	Higher
Transition Habitat Group	Moderate	Lower	Moderate	Lower	Higher	Lower	Moderate	Lower	Higher	Lower
Wetland Condition	-	Moderate	-	Lower	-	Moderate	-	Moderate	-	Moderate
Wetland Risk*	-	Higher	-	Higher	-	Lower	-	Lower	-	Moderate

\*average of sensitivity and stressors

**Table 2.4: Tidal Wetland WESP-AC Grouped Function Scores**

Wetland Functions or Other Attributes	WL-22
	Function rating
Storm Surge Interception	Higher
Water Purification	Lower
Organic Nutrient Export	Higher
Fish Habitat	Moderate
Waterbird Habitat	Lower
Songbird & Raptor Habitat	Higher
Biodiversity Maintenance	Lower
Wetland Stability	Moderate
Public Use & Recognition	Higher

### 3 SUMMARY OF FINDINGS

A total of twenty-five wetland and wetland complexes were observed within the PA. Of these, three were classified as marsh, ten as swamp, eleven as marsh/swamp complexes and one as a marsh/saltmarsh complex. The total wetland area delineated in the project area is approximately 86.24 ha which represent 15.8% of the total PA (approximately 545.04 ha).

A review of the wetland functional assessments results, indicates that the wetlands located within the PA provide the following overall functions and ratings:

- Hydrologic Group – Mostly Lower
- Water Quality Support Group – Mostly Moderate or Higher
- Aquatic Support Group – Mostly Moderate
- Aquatic Habitat Group – Mostly Moderate or Higher
- Transition Habitat Group – Mostly Moderate or Higher

The majority of the wetland areas located within the BHETF study boundaries appear to be in moderate to good condition. However, it should be noted that they are also moderately or highly prone to degradation due to their risk score, which is an average of the wetland's stress and sensitivity scores. Wetlands located further from the effluent treatment infrastructure have been observed to be in better condition than those located within the immediate vicinity of effluent treatment infrastructure.

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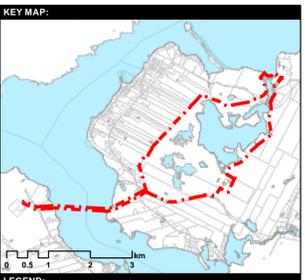
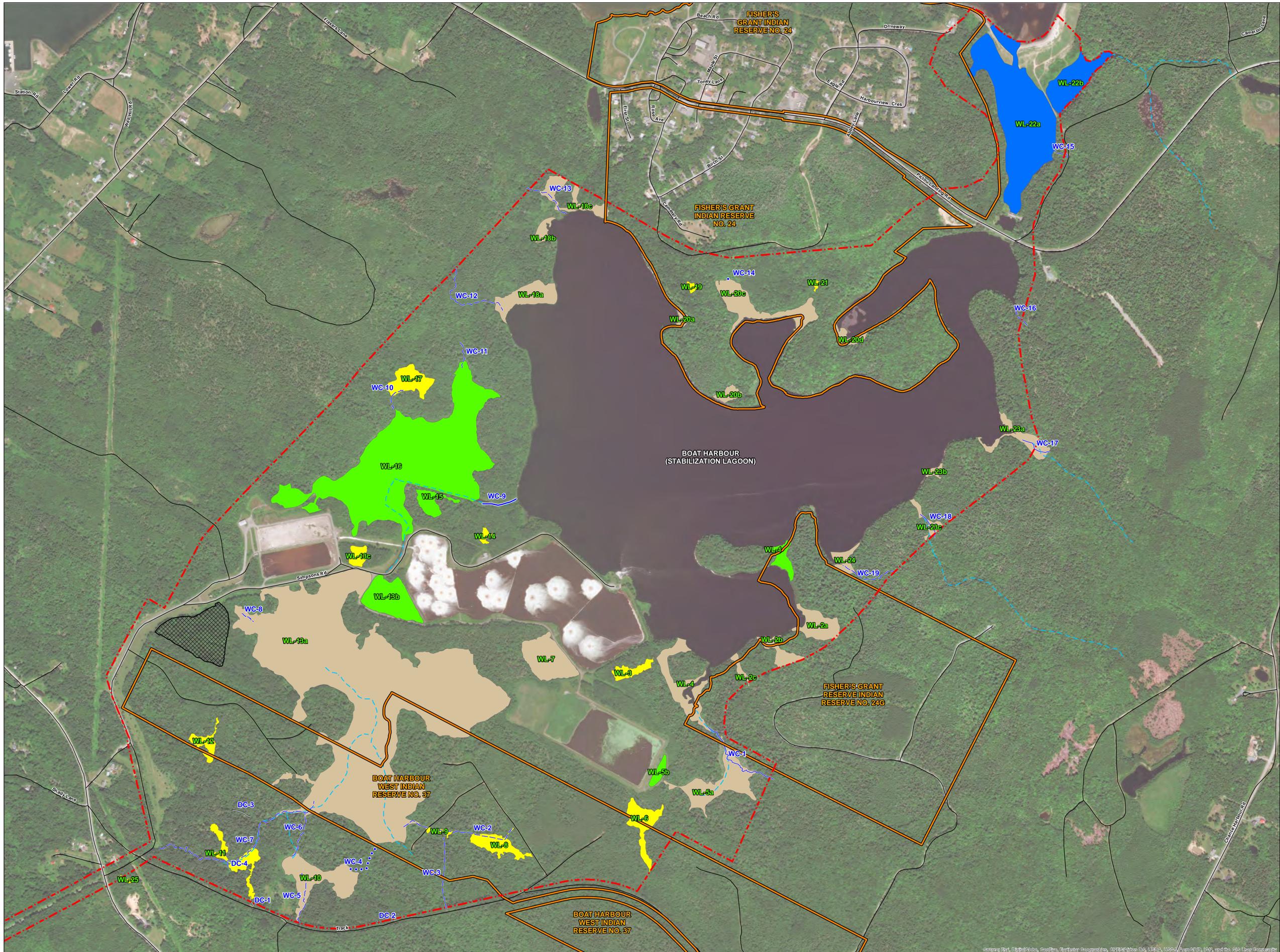
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# APPENDIX

## A FIGURES







- LEGEND:**
- WATERCOURSE CLASSIFICATION**
- Large Permanent
  - Small Permanent
  - Intermittent
  - Ephemeral
  - Drainage Channel
  - WATERCOURSE (GHD)
- WETLAND CLASSIFICATION**
- MARSH
  - MARSH SALT MARSH COMPLEX
  - MARSH COMPLEX
  - SWAMP
- FIELD DELINEATED WATERCOURSE LOCATIONS (WSP, 2017)**  
 (WC - watercourse; DC - drainage channel)
- FIELD DELINEATED WETLAND AREAS (WSP, 2017)**
- ROADS (GeoNOVA)
- APPROXIMATE LOCATION OF CLEARED AREA
- FIRST NATIONS TERRITORY BOUNDARY
- BOAT HARBOUR STUDY AREA BOUNDARY



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**PROJECT:**  
 BOAT HARBOUR REMEDIATION, PLANNING AND DESIGN

**PROJECT NO.:** 171-10478

**CLIENT:**

**FIGURE:**  
 TITLE: FIELD DELINEATED WETLANDS & WATERCOURSE CLASSIFICATIONS

**FIGURE NO.:** 2      **REVISION NO.:** 0

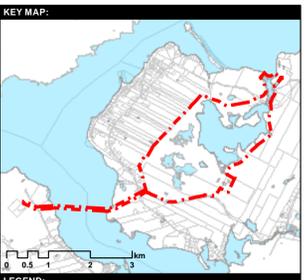
**SCALE:**  
 0 50 100 200 300 400 Meters  
 1:5,700

**DATUM:** NAD 83 CSRS      **PROJECTION:** UTM ZONE 20 NORTH

**DRAWN BY:** T. MOREHOUSE      **CHECKED BY:** C. LAFRAMME

**CREATED DATE:** (YYYY-MM-DD) 2018-03-13      **REVISION DATE:** (YYYY-MM-DD) 2018-03-13





- LEGEND:**
- FIELD DELINEATED WATERCOURSE (WSP, 2017)
  - WC - watercourse; DC - drainage channel
  - WATERCOURSE (GHD)
  - FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017)
  - FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017) (Delineation extends beyond Study Area Boundary)
  - ROADS (GeoNOVA)
  - APPROXIMATE LOCATION OF CLEARED AREA
  - FIRST NATIONS TERRITORY BOUNDARY
  - BOAT HARBOUR STUDY AREA BOUNDARY

- SOIL TYPE CLASSIFICATION**
- Cm5/A
  - Hd2/C
  - Hd2/D
  - Hd2/E
  - Hd3/C
  - Hd3/D
  - Hd3/E
  - Pw2/C
  - Su1/D
  - Su1/E
  - Su2/C
  - Su5/C



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**PROJECT:**  
PROJECT: BOAT HARBOUR REMEDIATION, PLANNING AND DESIGN

PROJECT NO.: 171-10478

CLIENT:

**FIGURE:**  
TITLE: SOILS PICTOU COUNTY

FIGURE NO.: 3 REVISION NO.: 0

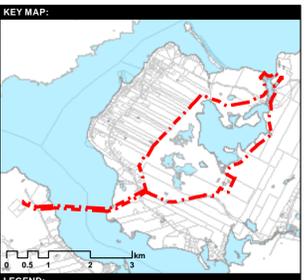
SCALE: 1:5,700

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 20 NORTH

DRAWN BY: T. MOREHOUSE CHECKED BY: C. LAFAMME

CREATED DATE: 2018-03-13 REVISION DATE: 2018-03-13





- LEGEND:**
- PAIRED PIT**
  - ★ UPLAND
  - ★ WETLAND
  - FIELD DELINEATED WATERCOURSE (WSP, 2017)
  - W/C - WATERCOURSE: DC - DRAINAGE CHANNEL
  - WATERCOURSE (GHD)
  - FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017)
  - FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017) (Delineation extends beyond Study Area Boundary)
  - ROADS (GeoNOVA)
  - APPROXIMATE LOCATION OF CLEARED AREA
  - FIRST NATIONS TERRITORY BOUNDARY
  - BOAT HARBOUR STUDY AREA BOUNDARY



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**PROJECT:**  
PROJECT: **BOAT HARBOUR REMEDIATION, PLANNING AND DESIGN**

PROJECT NO.: **171-10478**

CLIENT:

**FIGURE:**  
TITLE: **WETLAND ASSESSMENT PAIRED PIT LOCATIONS**

FIGURE NO.: **4** REVISION NO.: **0**

SCALE:  
0 50 100 200 300 400 METERS  
1:5,700

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 20 NORTH

DRAWN BY: T. MOREHOUSE CHECKED BY: C. LAFLAMME

CREATED DATE (YYYY-MM-DD): 2018-03-13 REVISION DATE (YYYY-MM-DD): 2018-03-13



# APPENDIX

# B

## PHOTOGRAPHIC LOG





Photo 1: WL-1 Wetland view, August 24, 2017

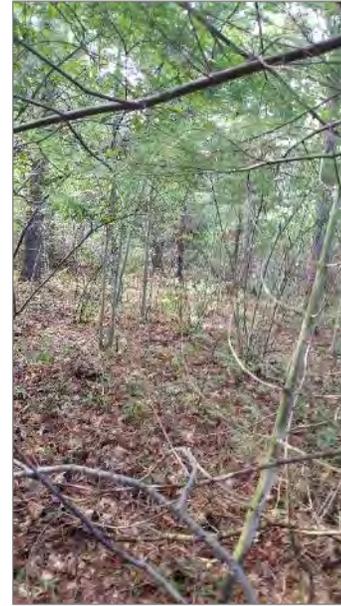


Photo 2: WL- 1 Upland view, August 24, 2017



Photo 3: WL-1 Wetland soil pit, August 24, 2017



Photo 4: WL-2a Wetland view, August 24, 2017



Photo 5: WL-2a Wet stained leaves, August 24, 2017



Photo 6: WL-2b Wetland view, September 1, 2017



Photo 7: WL-2b Wetland soil pit, September 1, 2017



Photo 8: WL-2b Upland view, September 1, 2017



Photo 9: WL-2b Upland soil, September 1, 2017



Photo 10: WL-2c Wetland view, August 24, 2017



Photo 11: WL-2c Wetland view, August 24, 2017



Photo 12: WL-3 Wetland view, September 29, 2017



Photo 13: WL-3 Upland soil pit, September 29, 2017



Photo 14: WL-3 Wetland soil pit, September 29, 2017



Photo 15: WL-4 Wetland, August 24, 2017



Photo 16: WL-4 Wetland soil pit, August 24, 2017



Photo 17: WL-4 Upland soil pit, August 24, 2017



Photo 18: WL-4 Upland view, August 24, 2017



Photo 19: WL-5a Wetland view, August 25, 2017



Photo 20: WL-5a Upland soil pit, August 25, 2017



Photo 21: WL-5b Wetland confined by berms, August 25, 2017



Photo 22: WL-5b Wetland view continued, August 25, 2017



Photo 23: WL-6 Wetland view, August 25, 2017



Photo 24: WL-6 Wetland soil pit, August 25, 2017



Photo 25: WL-6 Upland view, August 25, 2017



Photo 26: WL-6 Upland soil pit, August 25, 2017



Photo 27: WL-7 Wetland view, September 6, 2017



Photo 28: WL-7 Wetland soil pit, September 6, 2017



Photo 29: WL-7 Upland view, September 6, 2017



Photo 30: WL-7 Upland soil pit, September 6, 2017



Photo 31: WL-8 Wetland view, August 23, 2017



Photo 32: WL-8 Wetland soil pit, August 23, 2017



Photo 33: WL-8 Wetland view continued, August 23, 2017



Photo 34: WL-9 Wetland view, August 23, 2017



Photo 35: WL-9 Wetland soil pit, August 23, 2017



Photo 36: WL-9 Upland soil pit, August 23, 2017



Photo 37: WL-9 Upland view, August 23, 2017



Photo 38: WL-10 Wetland view, August 24, 2017



Photo 39: WL-10 Upland soil pit, August 24, 2017



Photo 40: WL-10 Upland view, August 24, 2017



Photo 41: WL-10 Wetland soil pit, August 24, 2017



Photo 42: WL-11 Wetland view, September 27, 2017



Photo 43: WL-11 Wetland view continued, September 27, 2017



Photo 44: WL-12 Wetland view, August 25, 2017



Photo 45: WL-12 Wetland soil pit, August 25, 2017



Photo 46: WL-12 Upland soil pit, August 25, 2017



Photo 47: WL-12 Canopy cover, August 25, 2017



Photo 48: WL-13a Wetland view, September 7, 2017



Photo 49: WL-13a Wetland soil pit, September 7, 2017



Photo 50: WL-13a Upland soil pit, September 7, 2017



Photo 51: WL-13a Upland view, September 7, 2017



Photo 52: WL-13b Wetland view, September 6, 2017



Photo 53: WL-13b Wetland view continued, September 6, 2017



Photo 54: WL-13c Upland view, September 6, 2017



Photo 55: WL-13c Wetland view, September 6, 2017



Photo 56: WL-14 Wetland view, September 8, 2017



Photo 57: WL-14 Wetland soil pit, September 8, 2017



Photo 58: WL-14, Upland view September 8, 2017



Photo 59: WL-15 Wetland view, September 8, 2017



Photo 60: WL-15 Wetland soil pit, September 8, 2017



Photo 61: WL-15 Upland soil pit, September 8, 2017



Photo 62: WL-15 Upland view, September 8, 2017



Photo 63: WL-16 Wetland view, September 7, 2017



Photo 64: WL-16 Upland soil pit, September 7, 2017



Photo 65: WL-16 Upland view, September 7, 2017



Photo 66: WL-16 Wetland soil pit, September 7, 2017



Photo 67: WL-17 Wetland view, September 8, 2017



Photo 68: WL-17 Wetland soil pit, September 8, 2017



Photo 69: WL-17 Upland soil pit, September 8, 2017



Photo 70: WL-17 Upland view, September 8, 2017



Photo 71: WL-18a Wetland view, August 23, 2017



Photo 72: WL-18a Wetland soil pit, August 23, 2017



Photo 73: WL-18a Upland soil pit, August 23, 2017



Photo 74: WL-18a Upland view, August 23, 2017



Photo 75: WL-18b Wetland view, August 23, 2017



Photo 76: WL-18b Wetland soil pit, August 23, 2017



Photo 77: WL-18b Upland view, August 23, 2017



Photo 78: WL-18b Upland soil pit, August 23, 2017



Photo 79: WL-18c Wetland view, August 23, 2017



Photo 80: WL-18c Wetland soil pit, August 23, 2017



Photo 81: WL-18c Upland view, August 23, 2017



Photo 82: WL-18c Upland soil pit, August 23, 2017



Photo 83: WL-19 Wetland view, August 14, 2017



Photo 84: WL-19 Wetland soil pit, August 14, 2017



Photo 85: WL-19 Upland soil pit, August 14, 2017



Photo 86: WL-19 Upland view, August 14, 2017



Photo 87: WL-20a Wetland view, August 16, 2017



Photo 88: WL-20a Wetland view continued, August 16, 2017



Photo 89: WL-20b Wetland view, August 14, 2017



Photo 90: WL-20b Wetland view continued, August 14, 2017



Photo 91: WL-20c Wetland view, August 14, 2017



Photo 92: WL-20c Wetland soil pit, August 14, 2017



Photo 93: WL-20c Upland view, August 14, 2017



Photo 94: WL-20c soil Upland soil, August 14, 2017



Photo 95: WL-20d Wetland view, August 14, 2017



Photo 96: WL-20d Wetland view continued, August 14, 2017



Photo 97: WL-21 Wetland view, August 25, 2017



Photo 98: WL-21 Wetland soil pit, August 25, 2017



Photo 99: WL-21 Upland view, August 25, 2017



Photo 100: WL-21 Upland soil pit, August 25, 2017



Photo 101: WL-22a Wetland view, August 15, 2017



Photo 102: Wetland 22a Wetland view continued, August 15, 2017



Photo 103: WL-22a Wetland soil pit, August 15, 2017



Photo 104: WL-22a Upland view, August 15, 2017



Photo 105: WL-22a Upland soil pit, August 15, 2017



Photo 106: WL-22b Wetland view, August 15, 2017



Photo 107: WL-22b Wetland view continued, August 15, 2017



Photo 108: WL-22b Wetland view continued, August 15, 2017



Photo 105: WL-23a Wetland view, August 16, 2017



Photo 106: WL-23a Wetland soil pit, August 16, 2017



Photo 107: WL-23a Upland view, August 16, 2017



Photo 108: WL-23a Upland soil pit, August 16, 2017



Photo 105: WL-23b Wetland view, August 16, 2017



Photo 106: WL-23b Wetland view continued, August 16, 2017



Photo 107: WL-23c Wetland view, August 16, 2017



Photo 108: WL-23c Wetland view continued, August 16, 2017



Photo 105: WL-23c, Dark stained soil, August 16, 2017



Photo 106: WL-24 Wetland view, August 24, 2017



Photo 107: WL-24 Wetland soil pit, August 24, 2017



Photo 108: WL-24 Upland view, August 24, 2017



Photo 105: WL-24 Upland soil pit, August 24, 2017



Photo 106: WL-25 Wetland view, November 28, 2017



Photo 107: WL-25 Wetland soil pit, November 28, 2017

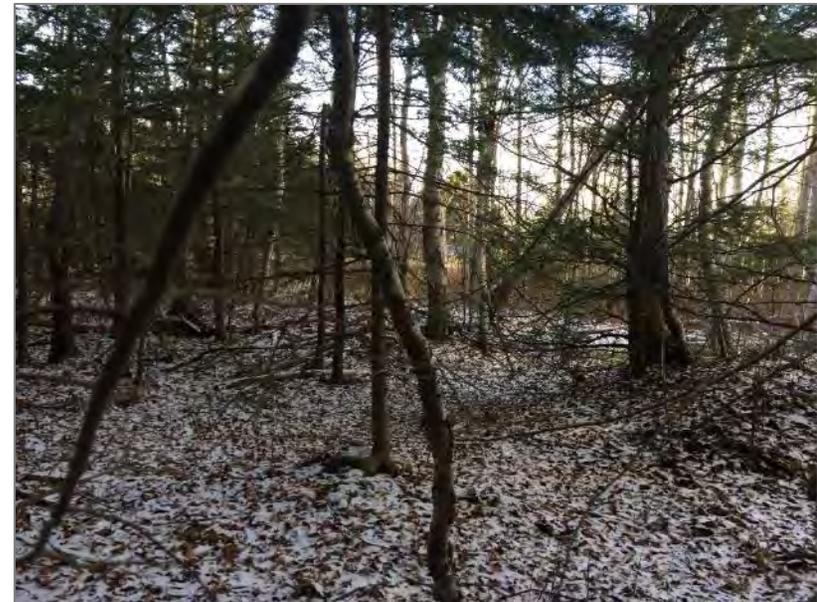


Photo 108: WL-25 Upland view, November 28, 2017



Photo 105: WL-24 Upland soil pit, November 28, 2017

# APPENDIX

C

WETLAND DELINEATION  
SHEETS

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

*W-1*

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug. 29, 2017  
 Applicant/Owner: NS Lands Sampling Point: WLDI-WL  
 Investigator(s): C. Laflamme + Brady Leights Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Base of Hillslope Local relief (concave, convex, none): none  
 Slope (%): 0 Lat: 5056396.48 Long: 507351.34 Datum: NAD83 UTMZON  
 Soil Map Unit Name/Type: Pugwash (Pua) Wetland Type: Marsh  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation  Soil  or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation  Soil  or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Betula populifolia</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. <u>Acer rubrum</u>	<u>2%</u>		<u>Fac</u>	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
5. _____				
<u>42</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Mirrica pensylvanica</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Q. incana</u>	<u>2%</u>	<input checked="" type="checkbox"/>	<u>FacW</u>	OBL species _____ x 1 = _____
3. _____				FACW species _____ x 2 = _____
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
<u>7</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Typha sp.</u>	<u>20%</u>		<u>Obl</u>	<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2. <u>Calamagrostis canadensis</u>	<u>100%</u>	<input checked="" type="checkbox"/>	<u>FacW</u>	<input type="checkbox"/> Dominance Test is >50%
3. <u>Munus affusus</u>	<u>2%</u>		<u>FacW</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
4. <u>Onoclea sensibilis</u>	<u>15%</u>		<u>FacW</u>	<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>137</u> = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. _____				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Contaminated site</u>				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WL D1-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-404	7.5YR 2.5/1	100						Organic

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

Black muck

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 0 cm  
 Water Table Present? Yes  No  Depth (inches): 0 cm  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0 cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-1

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24, 2017
Applicant/Owner: NS Lands Sampling Point: WL-D1-up
Investigator(s): C LaFlamme, B Leighte Affiliation: WSP
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none
Slope (%): 5-8% Lat: N 5056295.76 Long: E 527364.13 Datum: NAD83 UTM ZON
Soil Map Unit Name/Type: Dugwash (PU2) Wetland Type: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
Remarks: (Explain alternative procedures here or in a separate report.)
Vegetation borderline. Prevalence Index would indicate upland.

VEGETATION – Use scientific names of plants.

Table with columns: Tree Stratum (Plot size: 10m), Sapling/Shrub Stratum (Plot size: 5m), Herb Stratum (Plot size: 1m), Woody Vine Stratum (Plot size: ...). Includes Dominance Test worksheet and Prevalence Index worksheet.

Remarks: (Include photo numbers here or on a separate sheet.)
mostly leaf litter on ground

**SOIL**

Sampling Point: WLDI-UP

Ah  
Ae  
B

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <small>cm</small>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5	7.5YR 2.5/2	100					Silty	
5-20	7.5YR 6/3	100					Sandy	
20-30	7.5YR 5/8	100					Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.    <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
*Dry soil good drainage*

WL-2c

### WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24, 2017  
 Applicant/Owner: NS Lands Sampling Point: WL-G1-WL  
 Investigator(s): C Laflamme, B Leights Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Bottom Local relief (concave, convex, none): convex  
 Slope (%): 0 Lat: N 5056010.38 Long: E 527406.24 Datum: NAD 83 UTMZON  
 Soil Map Unit Name/Type: Pugwash (PW2) Wetland Type: forested

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

#### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydic Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Explain alternative procedures here or in a separate report.)			If yes, optional Wetland Site ID: _____

#### VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Acer rubrum</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Abies balsamea</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
50 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Pinus strobus</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
5 = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Osmunda cinnamomea</u>	<u>90%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Thelypteris noveboracensis</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>Onoclea sensibilis</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
105 = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	_____ = Total Cover

Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL**

Sampling Point: WL61-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <sup>PM</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-25cm	10YR 5/2	100 <sup>96</sup> %					clay	
25-40cm	10YR 5/4	100 <sup>96</sup> %					sand	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): 0

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

stained leaves

WL-2C

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24, 2017  
 Applicant/Owner: NS Lands Sampling Point: WL-G1-48  
 Investigator(s): C Laflamme, B Leighton Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none  
 Slope (%): 5 Lat: N 5056009.88 Long: E 527413.95 Datum: NAD83 UTM ZON  
 Soil Map Unit Name/Type: Pugwash (PW2) Wetland Type: Upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydic Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: (Explain alternative procedures here or in a separate report.) <u>Vegetation is borderline. Prevalence index would indicate upland</u>			If yes, optional Wetland Site ID: _____

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86%</u> (A/B)
1. <u>Picea rubens</u>	<u>10%</u>	<input type="checkbox"/>	<u>fac</u>	
2. <u>Prinus papulifera</u>	<u>5%</u>	<input type="checkbox"/>	<u>facu</u>	
3. <u>Picea glauca</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. <u>Abies balsamea</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
5. <u>Tsuga canadensis</u>	<u>10%</u>	<input type="checkbox"/>	<u>facu</u>	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<u>100</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Tsuga canadensis</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
2. <u>Pinus strobus</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Abies balsamea</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. _____	_____	<input type="checkbox"/>	_____	
5. _____	_____	<input type="checkbox"/>	_____	
<u>30</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Tridentalis borealis</u>	<u>2%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Maianthemum canadense</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. _____	_____	<input type="checkbox"/>	_____	
4. _____	_____	<input type="checkbox"/>	_____	
5. _____	_____	<input type="checkbox"/>	_____	
6. _____	_____	<input type="checkbox"/>	_____	
7. _____	_____	<input type="checkbox"/>	_____	
8. _____	_____	<input type="checkbox"/>	_____	
9. _____	_____	<input type="checkbox"/>	_____	
10. _____	_____	<input type="checkbox"/>	_____	
<u>7</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	<input type="checkbox"/>	_____	
2. _____	_____	<input type="checkbox"/>	_____	
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)  
mostly bare ground

**SOIL**

Sampling Point: WLG1-4p

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <i>cm</i>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<i>0-5cm</i>	<i>10YR 2/1</i>	<i>100%</i>					<i>Silty</i>	<i>Organic</i>
<i>5-40</i>	<i>2.5YR 5/6</i>	<i>100%</i>					<i>clay loam</i>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

*Dry*

WL-3

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Sept 29/17
Applicant/Owner: NSLands Sampling Point: WL-R-22
Investigator(s): BL, DB Affiliation: WSP
Landform (hillslope, terrace, etc.): BOWL Local relief (concave, convex, none): Concave
Slope (%): 0 Lat: N 505 5988.71 Long: E 526 855.84 Datum: UTM Z 20N
Soil Map Unit Name/Type: Pugwash PM2/C + Hansford HD2/C Wetland Type: Treed Swamp
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes [checked] No
Wetland Hydrology Present? Yes [checked] No
Is the Sampled Area within a Wetland? Yes [checked] No
If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m) Absolute % Cover Dominant Species? Indicator Status
1. Picea rubens 5 fac
2. Acer rubrum 10 fac
3. Betula populifolia 30 fac
45 = Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Betula populifolia 5% fac
2. Wild Raisin (Viburnum nudum) 5% fac
10% = Total Cover
Herb Stratum (Plot size: 1m)
1. Sedge sp. 40% fac?
2. Onoclea sensibilis 40% fac w
3. (narrow) cattail (Anagyris foenicul) 5% obl
85 = Total Cover
Woody Vine Stratum (Plot size: )
Remarks: (Include photo numbers here or on a separate sheet )

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species 5 x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
Rapid Test for Hydrophytic Vegetation
Dominance Test is >50%
Prevalence Index is <=3.0
Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation (Explain)
Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes [checked] No

WL-3

**SOIL**

Sampling Point: \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-20cm	5YR 5/1	95%	5YR 7/4	5%	D		Clay, loam	
20-30cm	10YR 2/1	100%					organic	
30-40cm	10YR 6/1	100%					Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): 30cm  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-3

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Sept 29/17
Applicant/Owner: NS Lands Sampling Point: WL-R-Up
Investigator(s): BL, DB Affiliation: WSP
Landform (hillslope, terrace, etc.): hill slope Local relief (concave, convex, none): convex
Slope (%): 3% Lat: N 5256004.87 Long: E 526858.25 Datum: UTM Z20N
Soil Map Unit Name/Type: Pugwash PW21C Wetland Type:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m)
1. Populus tremuloides 15% fac
2. Betula populifolia 15% fac
3. Picea Rubens 30% fac
60% = Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Viburnum nudum 5% fac
2. Betula populifolia 5% fac
3. Acer Rubrum 5% fac
4. Picea Rubens 10% fac
25% = Total Cover
Herb Stratum (Plot size: 1m)
1. Trientalis borealis 1% fac
2. Cornus canadensis 1% fac
2% = Total Cover
Woody Vine Stratum (Plot size: )
Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)
Total Number of Dominant Species Across All Strata: 9 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
Rapid Test for Hydrophytic Vegetation
Dominance Test is >50%
Prevalence Index is <=3.0
Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation (Explain)
Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes [checked] No

Handwritten calculations:
+ 100 | 50 | 10
- 60 | 30 | 12
-----
525 | 17.5 | 5
H 2 | 1 | 10.4

WL-3

**SOIL**

Sampling Point: \_\_\_\_\_

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-15cm	5YR 3/3	100					Organics	
15-25cm	5YR 4/6	100					Sandy	
25-50cm	5YR 4/4	100					Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: none  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

WL-4

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24, 2017  
 Applicant/Owner: NS Lands Sampling Point: WL-I-WL  
 Investigator(s): Claflemme, Bleights Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Bottom Local relief (concave, convex, none): Convex  
 Slope (%): 0 Lat: N 5056050 Long: E 526947 Datum: NAD83 UTM20W  
 Soil Map Unit Name/Type: Hansford (Hd3) Wetland Type: Forest complex  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Betula populifolia</u>	<u>80%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)  Total Number of Dominant Species Across All Strata: <u>4</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. <u>Acer rubrum</u>	<u>20%</u>		<u>Fac</u>	
3. <u>Abies balsamea</u>	<u>5%</u>		<u>Fac</u>	
<u>105</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>5m</u>)</b>				
1. <u>Acer rubrum</u>	<u>1%</u>		<u>Fac</u>	
2. <u>Betula populifolia</u>	<u>5%</u>		<u>Fac</u>	
3. <u>Amelanchier sp</u>	<u>1%</u>		<u>-</u>	
4. <u>Rubus pubescens</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	
<u>27</u> = Total Cover				
<b>Herb Stratum (Plot size: <u>1m</u>)</b>				
1. <u>Solidago rugosa</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Carex trisperma</u>	<u>2%</u>	<input checked="" type="checkbox"/>	<u>Obl</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>7</u> = Total Cover				
<b>Woody Vine Stratum (Plot size: _____)</b>				
1. _____				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Sphagnum moss present</u>				

**SOIL**

Sampling Point: WL-I-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-50 cm	10YR 5/2	80%	7.5YR 5/8	20%	RM	RL	Clay	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input checked="" type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

Saturation Present? Yes  No  Depth (inches): 0

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

WL-4

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24, 2017  
 Applicant/Owner: NS Lands Sampling Point: WL-I-0p  
 Investigator(s): C Laflamme, B Leight's Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Hillslope (near top) Local relief (concave, convex, none): Concave  
 Slope (%): 2-5% Lat: N 5056 054 Long: E 526947 Datum: NAD 83 (UTM ZON)  
 Soil Map Unit Name/Type: Hansford (Hd3) Wetland Type: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation  Soil  or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation  Soil  or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Remarks: (Explain alternative procedures here or in a separate report.)

Vegetation borderline. Prevalence Index would indicate upland.

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>84%</u> (A/B)
1. <u>Acer rubrum</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Abies balsamea</u>	<u>10%</u>	<input type="checkbox"/>	<u>fac</u>	
3. <u>Betula populifolia</u>	<u>80%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. _____				
5. _____				
<u>120</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Betula populifolia</u>	<u>50%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Abies balsamea</u>	<u>2%</u>	<input type="checkbox"/>	<u>fac</u>	
3. <u>Viburnum nudum</u>	<u>2%</u>	<input type="checkbox"/>	<u>fac</u>	
4. <u>Rubus sp (Blackberry)</u>	<u>2%</u>	<input type="checkbox"/>	<u>-</u>	
5. _____				
<u>56%</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Solidago rugosa</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Pteridium aquilifolia</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
3. <u>Maianthemum canadense</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>20%</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
2. _____				
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

Some upland moss

**SOIL**

Sampling Point: W16-I-4P

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <i>cm</i>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<i>0-5cm</i>	<i>7.5YR 2.5/2</i>	<i>100%</i>					<i>Silt</i>	
<i>5-35cm</i>	<i>7.5YR 4/6</i>						<i>clay loam</i>	<i>Rocky</i>

Ah  
B

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
*Dry Bore ground.*

WL-5a

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug. 25, 2017  
 Applicant/Owner: NS Lands Sampling Point: WLJ1-WL  
 Investigator(s): C. LaFlamme + Brady Leigh Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Convex  
 Slope (%): 0 Lat: 50 55 06.3, 29 Long: 52 7 13.7, 48 Datum: NAD83 UTM 20N  
 Soil Map Unit Name/Type: Hansford (Hd3) Wetland Type: Wetland Complex  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species _____ x 3 = _____
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
_____ = Total Cover				UPL species _____ x 5 = _____
_____ = Total Cover				Column Totals: _____ (A) _____ (B)
_____ = Total Cover				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Leersia oryzoides</u>	<u>95%</u>	<input checked="" type="checkbox"/>	<u>Obl</u>	<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2. <u>Solidago canadensis</u>	<u>20%</u>	<input type="checkbox"/>	<u>Fac</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
3. <u>Panicum sagittatum</u>	<u>5%</u>	<input type="checkbox"/>	<u>Obl</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
4. <u>Impatiens capensis</u>	<u>2%</u>	<input type="checkbox"/>	<u>Fac</u>	<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. _____	_____	_____	_____	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				
<u>No trees just snags</u>				
<u>No shrubs. open meadow</u>				

**SOIL**

Sampling Point: WLJ1-42L

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-40+	10YR 5/2	100%					Sandy clay	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:  
some small

**HYDROLOGY**

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> FAC-Neutral Test (D5)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): 25cm  
 Saturation Present? Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WLSa

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug. 25, 2017  
 Applicant/Owner: NS Lands Sampling Point: WLI-4p  
 Investigator(s): A LaFlamme + Brady Light Affiliation: WSP  
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave  
 Slope (%): 2 Lat: 50°58'66.38" N Long: 52°12'0.04" E Datum: NAD83 UTM ZON  
 Soil Map Unit Name/Type: Hantsford (Hd3) Wetland Type: UPLAND  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Vegetation is borderline</u>	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Picea glauca</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Acer rubrum</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>Pinus strobus</u>	<u>2%</u>		<u>FAC</u>	
4. _____				
5. _____				<u>47</u> = Total Cover
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Betula populifolia</u>	<u>15%</u>		<u>FAC</u>	
2. <u>Acer rubrum</u>	<u>2%</u>		<u>FAC</u>	
3. _____				
4. _____				
5. _____				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Doellingeria umbellata</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Rubus sp. (Blackberry)</u>	<u>5%</u>			
3. <u>Solidago rugosa</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				<u>45</u> = Total Cover
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Bare ground wide transition zone due to Beaver influence</u>				

**SOIL**

Sampling Point: WLJI-UP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-40	7.5YR 4/4	50	5.4R 5/8	40	C	m	Silty Clay	
			7.5YR 5/2	10	Rm	m		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> FAC-Neutral Test (D5)

**Secondary Indicators (minimum of two required)**

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Saturation Present? (includes capillary fringe) Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Dry soil

WL-6

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 25/17  
 Applicant/Owner: NS Lands Sampling Point: WL-P-WL  
 Investigator(s): MLD, ANF Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Concave  
 Slope (%): 0% Lat: N 5055531.91 Long: E 526815.27 Datum: UTM 220N  
 Soil Map Unit Name/Type: Pugwash (Pw2) Wetland Type: Deciduous tree swamp  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Betula populifolia</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A)  Total Number of Dominant Species Across All Strata: <u>7</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
2. <u>Acer rubrum</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Picea rubens</u>	<u>5%</u>		<u>fac</u>	
4. _____	_____		_____	
5. _____	_____		_____	
<u>45</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>5m</u>)</b>				
1. <u>Rhododendron canadense</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Nemopanthus mucronatus</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Ilex verticillata</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
4. <u>Frangula alnus</u>	<u>3%</u>		<u>fac</u>	
5. <u>Prunus pennsylvanica</u>	<u>1%</u>		<u>facu</u>	
6. <u>Picea rubens</u>	<u>3%</u>		<u>fac</u>	
<b>Herb Stratum (Plot size: <u>1m</u>)</b>				
1. <u>Acer rubrum</u>	<u>2%</u>		<u>fac</u>	
2. _____	_____		_____	
<u>59</u> = Total cover				
<b>Woody Vine Stratum (Plot size: _____)</b>				
1. _____	_____		_____	
2. _____	_____		_____	
_____ = Total Cover				
<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point: WL-P-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <sup>1</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-35	10YR 2/2	100%					silty	
35-55	10YR 5/1	100%					Sandy clay	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> FAC-Neutral Test (D5)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): near by (yes)

Water Table Present? Yes  No  Depth (inches): 40cm

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-6

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boot Harbour Municipality/County: Pictou Sampling Date: Aug 25/17
Applicant/Owner: NS Lands Sampling Point: WL-P-4p
Investigator(s): MLD, ANF, B L. Affiliation: WSP
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
Slope (%): 4% Lat: N 5055542.91 Long: E 526809.30 Datum: UTM 220N
Soil Map Unit Name/Type: Pugwash (Pw2) Wetland Type: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No [checked]
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No
If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m)
1. Picea rubens 25% [checked] fac
2. Acer rubrum 15% [checked] fac
3. Betula populifolia 5% fac
45 = Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Picea glauca 3% fac
2. Acer rubrum 3% fac
3. Myrica pennsylvanica 5% fac
4. Abies balsamea 15% [checked] fac
5. Picea rubens 15% [checked] fac
41 = Total Cover
Herb Stratum (Plot size: 1m)
1. Gaultheria procumbens 5% [checked] fac
2. Maianthemum canadense 1% fac
6 = Total Cover
Woody Vine Stratum (Plot size: )
Remarks: (Include photo numbers here or on a separate sheet.)
Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators:
Rapid Test for Hydrophytic Vegetation
Dominance Test is >50% [checked]
Prevalence Index is <= 3.0^1
Morphological Adaptations^1 (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation^1 (Explain)
^1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes No [checked]

**SOIL**

Sampling Point: WL-P-49

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) / cm	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 2/1	100%						organic
2-42	7.5YR 4/6	100%						

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-7

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Sep 6/17  
 Applicant/Owner: NS Lands Sampling Point: WLKI-WL  
 Investigator(s): CMK, BL Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none  
 Slope (%): 0 Lat: 5056004.60 Long: 526469.24 Datum: NAD83  
 Soil Map Unit Name/Type: Pugwash (Pw2) Wetland Type: Marsh / Swamp  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Betula populifolia</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A)
2. <u>Picea rubens</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Total Number of Dominant Species Across All Strata: <u>7</u> (B)
3. <u>Acer rubrum</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
5. _____				
<u>25</u> = Total Cover				<b>Prevalence Index worksheet:</b>
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Total % Cover of: _____ Multiply by: _____
1. <u>Spiraea tomentosa</u>	<u>2%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	OBL species _____ x 1 = _____
2. <u>Kalmia grandiflora</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	FACW species _____ x 2 = _____
3. <u>Gaultheria procumbens</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	FAC species _____ x 3 = _____
4. <u>Picea rubens</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	FACU species _____ x 4 = _____
5. _____				UPL species _____ x 5 = _____
<u>17</u> = Total Cover				Column Totals: _____ (A) _____ (B)
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index = B/A = _____
1. <u>Typha sp.</u>	<u>50%</u>	<input checked="" type="checkbox"/>	<u>obl</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Triadenum Praseri</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>obl</u>	
3. <u>Taraxacum officinale</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
4. <u>Lysimachia terrestris</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
5. <u>Lycopus uniflorus</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>90</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Sphagnum carolinense</u>				

**SOIL**

Sampling Point: WLK1-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-65cm	7.5YR 4/2	100					Sandclay	Epigeum top layer

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one is required; check all that apply)</b>	<b>Secondary Indicators (minimum of two required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>30 cm</u>	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0 cm</u>	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
very ponded areas around  
low water table

WL-7

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Sept 6 2017  
 Applicant/Owner: NS Lands Sampling Point: WL-K1-Up  
 Investigator(s): C. LaFlamme, B. Leights Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Hill slope Local relief (concave, convex, none): None  
 Slope (%): 2 Lat: 45 50 56 002.73 Long: E 526 462.23 Datum: NAD83  
 Soil Map Unit Name/Type: Pugwash (Pw2) Wetland Type: Upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydic Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: (Explain alternative procedures here or in a separate report.) <u>Vegetation is borderline. Prevalence index would indicate upland.</u>			If yes, optional Wetland Site ID: _____

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
1. <u>Acer rubrum</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Abies balsamea</u>	<u>2%</u>	<input type="checkbox"/>	<u>FAC</u>	
3. <u>Picea rubens</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
4. _____	_____	<input type="checkbox"/>	_____	
5. _____	_____	<input type="checkbox"/>	_____	
<u>57</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )				
1. <u>Viburnum nudum</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Gaylussacia bacatta</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>Vaccinium angustifolium</u>	<u>2%</u>	<input type="checkbox"/>	<u>FAC</u>	
4. _____	_____	<input type="checkbox"/>	_____	
5. _____	_____	<input type="checkbox"/>	_____	
<u>32</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )				
1. <u>Ateridium aquilinum</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>FACU</u>	
2. <u>Tricentalis borealis</u>	<u>2%</u>	<input type="checkbox"/>	<u>FAC</u>	
3. <u>Maianthemum canadense</u>	<u>2%</u>	<input type="checkbox"/>	<u>FAC</u>	
4. _____	_____	<input type="checkbox"/>	_____	
5. _____	_____	<input type="checkbox"/>	_____	
6. _____	_____	<input type="checkbox"/>	_____	
7. _____	_____	<input type="checkbox"/>	_____	
8. _____	_____	<input type="checkbox"/>	_____	
9. _____	_____	<input type="checkbox"/>	_____	
10. _____	_____	<input type="checkbox"/>	_____	
<u>14</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	<input type="checkbox"/>	_____	
2. _____	_____	<input type="checkbox"/>	_____	
_____ = Total Cover				
<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Upland mass bare ground</u>				

**SOIL**

Sampling Point: WL-K1 up

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5cm	7.5YR 3/2	100%					silty	Root Layer
5-15cm	7.5YR 4/4	100%					clay loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Dry  
 Leaves not stained  
 Soil well drained

WL-8

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 23/17  
 Applicant/Owner: NS Lands Sampling Point: WL-K-WL  
 Investigator(s): MLD, ANF Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): minimal concave - flat  
 Slope (%): \_\_\_\_\_ Lat: N 5055338.32 Long: E 526428.11 Datum: UTM220N, NAD83  
 Soil Map Unit Name/Type: Pugwash (Pw2) Wetland Type: Tall treed swamp  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
1. <u>Tsuga canadensis</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
2. <u>Betula alleghaniensis</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Fraxinus americana</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. <u>Abies balsamea</u>	<u>10%</u>		<u>fac</u>	
5. <u>Picea rubens</u>	<u>5%</u>		<u>fac</u>	
<u>65</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )				
1. <u>Fraxinus americana</u>	<u>3%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. _____				
3. _____				
4. _____				
5. _____				
<u>3</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )				Hydrophytic Vegetation Indicators: ____ Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% ____ Prevalence Index is ≤3.0 <sup>1</sup> ____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. <u>Anaclea sensibilis</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
2. <u>Osmunda claytoniana</u>	<u>5%</u>		<u>fac</u>	
3. <u>Impatiens pallida</u>	<u>5%</u>		<u>facw</u>	
4. <u>Symphoricarpon purpureum</u>	<u>1%</u>		<u>facw</u>	
5. <u>Maianthemum canadense</u>	<u>2%</u>		<u>fac</u>	
6. <u>Carex trisperma</u>	<u>3%</u>		<u>obl</u>	
7. <u>Equisetum sp.</u>	<u>1%</u>		<u>fac</u>	
8. _____				
9. _____				
10. _____				
<u>27</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
1. _____				
2. _____				
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)  
Sphagnum moss

**SOIL**

Sampling Point: WOL-R-L

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <i>cm</i>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3cm								organic leaf litter
3-31cm	10YR 7/2	75%	7.5YR 4/6	25%	C	m	clay	
31-52cm	10YR 5/2	100%					Sandy clay	
52-73cm	2.5YR 3/2	90%	7.5YR 4/3	10%	D	m	Sandy clay	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): \_\_\_\_\_

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Driest time of year sampling puddling evidence

WL-8

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 23/17
Applicant/Owner: NS Lands Sampling Point: WL-K-Up
Investigator(s): MLD, ANF Affiliation: WSP
Landform (hillslope, terrace, etc.): hill slope Local relief (concave, convex, none): Convex
Slope (%): 2% Lat: N 5055329.03 Long: E 526424.56 Datum: UTM 220N
Soil Map Unit Name/Type: Pugwash (Pw2) Wetland Type: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation, Soil, or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydic Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
Remarks: (Explain alternative procedures here or in a separate report.)
- Near road evidence of previous bulldozing
- High berm with small pool.

VEGETATION - Use scientific names of plants.

Table with columns: Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, Woody Vine Stratum, Absolute % Cover, Dominant Species?, Indicator Status, and Dominance Test worksheet. Includes species like Tsuga canadensis, Acer rubrum, Picea rubens, Abies balsamea, and Dennstaedtia punctilobula.

Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL**

Sampling Point: UL-K-4p

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <small>1cm</small>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<u>0-5cm</u>								<u>organic root material</u>
<u>5-30cm</u>	<u>7.5YR 2/3</u>	<u>100%</u>					<u>clay</u>	
<u>30-58cm</u>	<u>10YR 5/3</u>	<u>85%</u>	<u>2.5YR 5/4</u>	<u>5%</u>	<u>D</u>	<u>m</u>	<u>sandy</u>	
			<u>10YR 5/8</u>	<u>10%</u>	<u>C</u>	<u>m</u>	<u>sandy</u>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

<b>Primary Indicators (minimum of one is required; check all that apply)</b>	<b>Secondary Indicators (minimum of two required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-9

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 23/17
Applicant/Owner: NS Lands Sampling Point: WL-I-WL
Investigator(s): MLD, ANF Affiliation: WSP
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Concave
Slope (%): 0 Lat: N 5055432.90 Long: E 526158.98 Datum: UTM220N
Soil Map Unit Name/Type: Pugonish (Pw2) Wetland Type: Tall shrub swamp
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes [checked] No
Wetland Hydrology Present? Yes [checked] No
Is the Sampled Area within a Wetland? Yes [checked] No
Remarks: (Explain alternative procedures here or in a separate report.)
- Two water courses running into wetland

VEGETATION - Use scientific names of plants.

Table with columns for Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, and Woody Vine Stratum. Includes sub-tables for Dominance Test worksheet, Prevalence Index worksheet, and Hydrophytic Vegetation Indicators. Handwritten entries include species like Betula populifolia, Acer rubrum, and Carex crinata.

Remarks: (Include photo numbers here or on a separate sheet.)
Leaf Litter, surface water and exposed soil

**SOIL**

Sampling Point: WL-I-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <i>cm</i>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<u>0-54cm</u>	<u>7.5 YR 3/1</u>	<u>100%</u>					<u>silty clay</u>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	
<input checked="" type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 45cm

Water Table Present? Yes  No  Depth (inches): 45cm

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Beaver influenced due to old dam on culvert downstream.

WL-9

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 23/17
Applicant/Owner: NS Lands Sampling Point: WL-I-48
Investigator(s): MLD, ANF Affiliation: WSP
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex
Slope (%): 2% Lat: N 5055444.98 Long: E 506156.82 Datum: UTM220N
Soil Map Unit Name/Type: Pugwash (Pw2) Wetland Type:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation, Soil, or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m) Absolute % Cover Dominant Species? Indicator Status
1. Tsuga canadensis 75% [checked] Facu
2. Pinus strobus 5% Fac
3. Betula alleghaniensis 10% Fac
90 = Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Betula alleghaniensis 5% Fac
2. Pinus strobus 3% Fac
3. Picea rubens 15% Fac
4. Abies balsamea 60% [checked] Fac
5. Tsuga canadensis 10% Facu
Betula populifolia 3% Fac
96 = Total Cover
Herb Stratum (Plot size: )
1. Maianthemum canadense 1% [checked] Fac
2. Linnaea borealis 1% [checked] Fac
2 = Total Cover
Woody Vine Stratum (Plot size: )
Hydrophytic Vegetation Present? Yes [checked] No
Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL**

Sampling Point: WL-I-4P

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-13cm	7.5YR 2.5/2	100%					peat organic root matter	
13-44cm	7.5YR 4/6	100%					Sandy silt	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-10

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24/17  
 Applicant/Owner: NS Lands Sampling Point: WL-M-WL  
 Investigator(s): MLD, ANF Affiliation: WSP  
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none  
 Slope (%): 0 Lat: N 5055300.39 Long: E 525755.10 Datum: UTM270N  
 Soil Map Unit Name/Type: Hausford (H02) Wetland Type: Treed Forested Swamp/marsh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Wetland area on eastside of large pond is used by humans - ATV trail and fence.</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Acer rubrum</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. <u>Abies balsamea</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
4. _____				
5. _____				
<u>20</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Viburnum nudum</u>	<u>3%</u>		<u>fac</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Alnus incana</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	OBL species _____ x 1 = _____
3. <u>Betula populifolia</u>	<u>1%</u>		<u>fac</u>	FACW species _____ x 2 = _____
4. <u>Abies balsamea</u>	<u>3%</u>		<u>fac</u>	FAC species _____ x 3 = _____
5. <u>Acer rubrum</u>	<u>3%</u>		<u>fac</u>	FACU species _____ x 4 = _____
6. <u>Ilex verticillata</u>	<u>1%</u>		<u>facw</u>	UPL species _____ x 5 = _____
<u>21</u> = Total Cover				Column Totals: _____ (A) _____ (B)
Prevalence Index = B/A = _____				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Opoclea sensibilis</u>	<u>3%</u>		<u>facw</u>	<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2. <u>Carex lurida</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>obl</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
3. <u>Menta sp.</u>	<u>5%</u>		<u>-</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
4. <u>Chelone glabra</u>	<u>2%</u>		<u>facw</u>	<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. <u>Carex grandifolia?</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>-</u>	<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. <u>Persicaria arifolia</u>	<u>3%</u>		<u>obl</u>	
7. <u>Kubus hispidus</u>	<u>3%</u>		<u>facw</u>	
8. <u>Equisetum sp.</u>	<u>3%</u>		<u>-</u>	
9. <u>Impatiens capensis</u>	<u>1%</u>		<u>fac</u>	
10. _____				
<u>40</u> = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point: WL-M-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <sup>CM</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5cm	brown	100%						organics
5-14cm	2.5YR 4/2	90%	10YR 5/6	5%	C	m	clay silt	
			5YR 3/3	5%	D	m	clay silt	
14-61cm	7.5YR 4/4	90%	10YR 5/6	7%	C	m	clay silt	
			5YR 3/4	3%	D	m	clay silt	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): 50cm  
 Saturation Present? Yes  No  Depth (inches): 30cm  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-10

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24/17  
 Applicant/Owner: NSLands Sampling Point: WL-m-up  
 Investigator(s): MLD, ANF Affiliation: WSP  
 Landform (hillslope, terrace, etc.): hill slope Local relief (concave, convex, none): Convex  
 Slope (%): 2% Lat: N 5055321.44 Long: 525747.81 Datum: UTM 220N  
 Soil Map Unit Name/Type: Hansford (H2) Wetland Type: upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydic Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: (Explain alternative procedures here or in a separate report.)			If yes, optional Wetland Site ID: _____
<p>-Wetland area on eastside of large pond is used by humans.          -ATV trail and fence</p>			

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10 m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Abies balsamea</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Populus tremuloides</u>	<u>5%</u>	<input type="checkbox"/>	<u>fac</u>	
3. <u>Picea rubens</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. _____	_____	<input type="checkbox"/>	_____	
5. _____	_____	<input type="checkbox"/>	_____	
<u>30</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5 m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Quercus rubra</u>	<u>2%</u>	<input type="checkbox"/>	<u>facu</u>	
2. <u>Acer rubrum</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Populus tremuloides</u>	<u>3%</u>	<input type="checkbox"/>	<u>fac</u>	
4. <u>Abies balsamea</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
5. <u>Ilex verticillata</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
6. <u>Rhododendron canadense</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>pac</u>	
<u>40</u> = Total Cover				
Herb Stratum (Plot size: <u>1 m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Cornus canadensis</u>	<u>35%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Clintonia borealis</u>	<u>2%</u>	<input type="checkbox"/>	<u>fac</u>	
3. <u>Maianthemum canadense</u>	<u>1%</u>	<input type="checkbox"/>	<u>fac</u>	
4. <u>Vaccinium myrtilloides</u>	<u>3%</u>	<input type="checkbox"/>	<u>fac</u>	
5. _____	_____	<input type="checkbox"/>	_____	
6. _____	_____	<input type="checkbox"/>	_____	
7. _____	_____	<input type="checkbox"/>	_____	
8. _____	_____	<input type="checkbox"/>	_____	
9. _____	_____	<input type="checkbox"/>	_____	
10. _____	_____	<input type="checkbox"/>	_____	
<u>41</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	<input type="checkbox"/>	_____	
2. _____	_____	<input type="checkbox"/>	_____	
_____ = Total Cover				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point: WL-M-4P

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <small>cm</small>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6cm	10 YR 2/2	100%						Organic root matter
6-61cm	10 YR 3/4	100%						Clay silt.

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL11

Aug 23 - Wetland L  
Sept 27 - Wetland RST

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 23/17  
Applicant/Owner: NS Lands Sampling Point: Wetland L - wet  
Investigator(s): MLD, ANF Affiliation: WSP Canada Inc  
Landform (hillslope, terrace, etc.): Hill slope Local relief (concave, convex, none): convex, flat  
Slope (%): 0-5% Lat: 5055234.137 N Long: 525529.795 E Datum: UTM Z20N  
Soil Map Unit Name/Type: Hantsford Hd 2/C Wetland Type: Swamp forested  
Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No   
Are Vegetation N, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes  No   
Are Vegetation N, Soil Y, or Hydrology Y naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes  No   
Hydric Soil Present? Yes  No   
Wetland Hydrology Present? Yes  No   
Is the Sampled Area within a Wetland? Yes  No   
If yes, optional Wetland Site ID: \_\_\_\_\_  
Remarks: (Explain alternative procedures here or in a separate report.)  
- Wetland along old effluent line. Previously dredged and made into a wide channel with wetlands upland connected th.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. Acer rubrum	5%	<input checked="" type="checkbox"/>	fac	Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
2. Picea rubra	3%	<input checked="" type="checkbox"/>	fac	Total Number of Dominant Species Across All Strata: 5 (B)
3.				Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
4.				
5.				
8% = Total Cover				Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: 5m)	Total % Cover of:	Multiply by:		
1. Betula populifolia	3%	fac		OBL species x 1 =
2. Alnus incana	45%	facw		FACW species x 2 =
3. Acer rubrum	20%	fac		FAC species x 3 =
4.				FACU species x 4 =
5.				UPL species x 5 =
68% = Total Cover				Column Totals: (A) (B)
Herb Stratum (Plot size: 1m)				Prevalence Index = B/A =
1. Anoclea sensibilis	20%	facw		
2. Equisetum sylvaticum	2%	fac		
3. Carex crinita	5%	fac		
4.				
5.				
6.				
7.				
8.				
9.				
10.				
27% = Total Cover				Hydrophytic Vegetation Indicators:
Woody Vine Stratum (Plot size: )				
1.				<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2.				<input checked="" type="checkbox"/> Dominance Test is >50%
				<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
				<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: (Include photo numbers here or on a separate sheet)  
Similar to forested section of wetland J

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

	100	50	20
+	8	4	1.6
5	68	34	13.6
H	27	13.5	5.4

WL II

**SOIL**

Sampling Point: \_\_\_\_\_

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4cm								organic
4-40cm	10YR 4/2	100%						clay/silt

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): 6cm  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-11

- Same as welland J upland, no point taken.

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 23/17
Applicant/Owner: NS Lands Sampling Point: Wetland L-up
Investigator(s): MLD, ANF Affiliation: WSP Canada Inc
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): None
Slope (%): 0% Lat: Long: Datum:
Soil Map Unit Name/Type: Hantsford Hd 2/c Wetland Type:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No
Hydric Soil Present? Yes No
Wetland Hydrology Present? Yes No
Is the Sampled Area within a Wetland? Yes No
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: ) Absolute % Cover Dominant Species? Indicator Status
Sapling/Shrub Stratum (Plot size: )
Herb Stratum (Plot size: )
Woody Vine Stratum (Plot size: )
Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: (A)
Prevalence Index worksheet: Total % Cover of: Multiply by:
Hydrophytic Vegetation Indicators: Rapid Test for Hydrophytic Vegetation
Hydrophytic Vegetation Present? Yes No

WL-11

SOIL Sampling Point: \_\_\_\_\_

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes _____ No _____
Remarks:	

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ <small>(includes capillary fringe)</small>	<b>Wetland Hydrology Present?</b> Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-12

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 25/17
Applicant/Owner: NS Lands Sampling Point: WL-0-BL
Investigator(s): MLD, ANF Affiliation: WSP
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none
Slope (%): 0 Lat: N 5055752.20 Long: E 525384.34 Datum: UTM 2 20N
Soil Map Unit Name/Type: Hanford (H2) Wetland Type: Tall shrub swamp
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation, Soil, or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes [checked] No
Wetland Hydrology Present? Yes [checked] No
Is the Sampled Area within a Wetland? Yes [checked] No
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m)
1. Picea rubens 15% [checked] fac
2. Betula alleghaniensis 5% [checked] fac
3. Acer rubrum 3% fac
Total Cover: 23
Sapling/Shrub Stratum (Plot size: 5m)
1. Ilex verticillata 15% [checked] facw
2. Alnus incana 5% facw
3. Abies balsamea 20% [checked] fac
4. Fraxinus americana 1% fac
5. Picea rubens 5% fac
Total Cover: 46
Herb Stratum (Plot size: 1m)
1. Iris versicolor 3% facw
2. Carex sp 5% -
3. Carex granularis 30% [checked] fac
4. Equisetum sp. 1% -
5. Maianthemum canadense 3% fac
Total Cover: 42
Woody Vine Stratum (Plot size: )
Hydrophytic Vegetation Present? Yes [checked] No

**SOIL**

Sampling Point: WL-0-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3								organic (brown)
3-16	10YR 4/2	90%	10YR 4/6	10%	C	PL		silty clay
16-48	7.5YR 5/2	80%	5YR 4/3	20%	O	M		silty clay
48-62	5YR 3/2	100%						silty clay

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): 0

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-12

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 25/17
Applicant/Owner: NS Lands Sampling Point: WL-0-UP
Investigator(s): MLD, ANE Affiliation: WSP
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Concave hummocks
Slope (%): 1% Lat: N 5055756.65 Long: E 525385.13 Datum: UTM 220N
Soil Map Unit Name/Type: Housford (H02) Wetland Type: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation, Soil, or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No [checked]
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m)
1. Picea rubens 85% [checked] Fac
2. Betula populifolia 5% [checked] Fac
Total Cover: 90
Sapling/Shrub Stratum (Plot size: 5m)
1. Betula populifolia 5% [checked] Fac
2. Abies balsamea 10% [checked] Fac
3. Acer rubrum 5% [checked] Fac
4. Picea rubens 5% [checked] Fac
Total Cover: 25
Herb Stratum (Plot size: 1m)
1. Maianthemum canadensis 2% [checked] Fac
2. Trientalis borealis 1% [checked] Fac
Total Cover: 3
Woody Vine Stratum (Plot size: )
Total Cover:
Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)
Total Number of Dominant Species Across All Strata: 7 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators:
[checked] Rapid Test for Hydrophytic Vegetation
[checked] Dominance Test is >50%
[ ] Prevalence Index is <=3.0^1
[ ] Morphological Adaptations^1 (Provide supporting data in Remarks or on a separate sheet)
[ ] Problematic Hydrophytic Vegetation^1 (Explain)
^1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes No [checked]

**SOIL**

Sampling Point: WL-0-4P

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <sup>cm</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6								organic
6-14	10YR 5/3	100%					silty	
14-46	10YR 4/6	65%	7.5YR 4/6	35%	C	m	silty	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-13a

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24/17
Applicant/Owner: NS Lands Sampling Point: WL-J-WL
Investigator(s): MLD, ANF Affiliation: WSP
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none
Slope (%): 0 Lat: N 5055562.16 Long: E 525732.23 Datum: UTM220 N
Soil Map Unit Name/Type: Hantsford (H22) Wetland Type: Marsh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes [checked] No
Wetland Hydrology Present? Yes [checked] No
Is the Sampled Area within a Wetland? Yes [checked] No
If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m)
1. Acer rubrum 5% [checked] fac
2.
3.
4.
5.
5 = Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Betula populifolia 5% fac
2. Alnus viridis 60% [checked] facu
3. Acer rubrum 20% [checked] fac
4.
5.
85 = Total Cover
Herb Stratum (Plot size: 1m)
1. Carex lurida 5% obl
2. Carex crinata 5% obl
3. Onoclea sensibilis 10% [checked] facw
4. Equisetum sp. 3% -
5. Menta sp 2% -
6. Galium sp 1% -
7.
8.
9.
10.
26 = Total Cover
Woody Vine Stratum (Plot size: )
1.
2.
= Total Cover
Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)
Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators:
Rapid Test for Hydrophytic Vegetation
Dominance Test is >50% [checked]
Prevalence Index is <=3.0^1
Morphological Adaptations^1 (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation^1 (Explain)
^1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes [checked] No
Remarks: (Include photo numbers here or on a separate sheet.)
Sphagnum moss

**SOIL**

Sampling Point: WL-J-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <sup>1</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4cm								organic.
4-22cm	10YR 4/2	100%						clay silt
22-43cm	10YR 5/2	95%	7.5YR 4/6	5%	C	m		Sandy silt

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**  
 Type: Cobble  
 Depth (inches): 43cm

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input checked="" type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 3cm

Water Table Present? Yes  No  Depth (inches): 3cm

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-13a

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24/17
Applicant/Owner: NS Lands Sampling Point: WL-J-up
Investigator(s): MLD, ANF Affiliation: WSP
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex
Slope (%): 5% Lat: N 5055565.58 Long: E 525723.84 Datum: UTM220N
Soil Map Unit Name/Type: Hausford (Hd2) Wetland Type:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes No
Hydric Soil Present? Yes No
Wetland Hydrology Present? Yes No
Is the Sampled Area within a Wetland? Yes No
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m) Absolute % Cover Dominant Species? Indicator Status
1. Tsuga canadensis 40% facu
2. Acer rubrum 55% fac
3. Abies balsamea 10% Pac
4. Betula alleghaniensis 5% fac
110 = Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Abies balsamea 15% Pac
2. Picea rubens 5% fac
3. Viburnum nudum 2% fac
4. Kalmia angustifolia 3% fac
25 = Total Cover
Herb Stratum (Plot size: 1m)
1. Pteridium aquilinum 5% fac
2. Cornus canadensis 5% fac
3. Trientalis borealis 2% fac
4. Lycopodium sp 1% -
5. Dryopteris cristata 1% facw
6. Aralia nudicaulis 2% fac
7. Maianthemum canadense 1% fac
17 = Total Cover
Woody Vine Stratum (Plot size: )
Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 84% (A/B)
Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators:
Rapid Test for Hydrophytic Vegetation
Dominance Test is >50%
Prevalence Index is <=3.0
Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation (Explain)
Hydrophytic Vegetation Present? Yes No

**SOIL**

Sampling Point: WJL-J-4/P

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <sup>FM</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6cm							Silty organic	
6-20cm	10YR 3/3	100%					clay, silt	
20-43cm	7.5YR 4/6	95%	5YR 4/6	5%	C	m	clay, silt	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: Rock  
 Depth (inches): 43cm

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-14

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Halifax Sampling Date: Sept 8, 2011  
 Applicant/Owner: US Lands Sampling Point: WLNI-43L  
 Investigator(s): C. LaPlante & P. Loigis Affiliation: USP  
 Landform (hillslope, terrace, etc.): Bottom Local relief (concave, convex, none): Concave  
 Slope (%): 0 Lat: 5056484.51 Long: 526311.91 Datum: NAD83  
 Soil Map Unit Name/Type: Skulie (Su2) Wetland Type: Forested

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Picea rubens</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. <u>Acer rubrum</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
5. _____				
<u>60</u> = Total Cover				<b>Prevalence Index worksheet:</b>
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Total % Cover of: _____ Multiply by: _____
1. <u>Nemopanthus mucronatus</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	OBL species _____ x 1 = _____
2. <u>Viburnum nudum</u>	<u>20%</u>		<u>fac</u>	FACW species _____ x 2 = _____
3. <u>Laccaria amethystina</u>	<u>2%</u>		<u>fac</u>	FAC species _____ x 3 = _____
4. _____				FACU species _____ x 4 = _____
5. _____				UPL species _____ x 5 = _____
<u>24</u> = Total Cover				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b>
1. <u>none</u>				<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2. _____				<input checked="" type="checkbox"/> Dominance Test is >50%
3. _____				<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
4. _____				<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>0</u> = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) <u>In a disturbed wooded location</u>				

**SOIL**

Sampling Point: WLW1-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-30	7.5YR 2.5/2	100					Organic	
30-35	7.5YR 5/2	100					slud	
35-45	10YR 4/3	100					Sand	
45-50	slay 8/104	100					sand	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>50cm</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0</u>	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-14

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Sept 9, 2008  
 Applicant/Owner: NS Lands Sampling Point: WLN1-UP  
 Investigator(s): C. La Flamme & B. Leigh Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none  
 Slope (%): 2-5 Lat: 46° 04' 22.71 Long: 54° 31' 16.13 Datum: NAD83  
 Soil Map Unit Name/Type: Shulip (su2) Wetland Type: Upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydic Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: (Explain alternative procedures here or in a separate report.) <u>Vegetation borderline. Prevalence index would indicate upland.</u>			If yes, optional Wetland Site ID: _____

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83%</u> (A/B)
1. <u>Picea rubens</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Acer rubrum</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Betula papyrifera</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>45</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum</b> (Plot size: <u>5m</u> )				
1. <u>Urtica angustifolia</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Gaultheria procumbens</u>	<u>60%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Pinus strobus</u>	<u>1%</u>	_____	<u>fac</u>	
4. <u>Viburnum nudum</u>	<u>5%</u>	_____	<u>fac</u>	
5. <u>Abies balsamea</u>	<u>1%</u>	_____	<u>fac</u>	
<u>147</u> = Total Cover				
<b>Herb Stratum</b> (Plot size: <u>1m</u> )				
1. <u>Pteridium aquilinum</u>	<u>7%</u>	_____	<u>facu</u>	
2. <u>Cornus canadensis</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Trientalis borealis</u>	<u>5%</u>	_____	<u>fac</u>	
4. <u>Urtica dioica</u>	<u>5%</u>	_____	<u>fac</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>32</u> = Total Cover				
<b>Woody Vine Stratum</b> (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WLN1-4P

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5cm	7.5YR3/2	100					silt	Organic humus
5-40cm	10YR 4/6	90	10YR 6/4	10	D	M	loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Recent Heavy rain, soil well drained

WL 15

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Bad Harbour Municipality/County: Pictou Sampling Date: Sept 3, 2012  
 Applicant/Owner: US Lands Sampling Point: WLM1-WL  
 Investigator(s): Chaffin + B. Leitch Affiliation: USP  
 Landform (hillslope, terrace, etc.): Bottom Local relief (concave, convex, none): concave  
 Slope (%): \_\_\_\_\_ Lat: 5056493.92 Long: 526145.15 Datum: NAD83  
 Soil Map Unit Name/Type: Shulie (Su2) Wetland Type: Cattail marsh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Picea rubens</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Acer rubrum</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. _____				
4. _____				
5. _____				
<u>30</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Betula populifolia</u>	<u>5%</u>		<u>fac</u>	
2. <u>Picea rubens</u>	<u>5%</u>		<u>fac</u>	
3. <u>Gaylussacia bacatta</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. <u>Ilex verticillata</u>	<u>5%</u>		<u>facw+</u>	
5. <u>Kalmia angustifolia</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
<u>49</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> ___ Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% ___ Prevalence Index is ≤3.0 <sup>1</sup> ___ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Spartanium americanum</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>obl</u>	
2. <u>Bidens frondosa</u>	<u>50%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
3. <u>Lycopus uniflorus</u>	<u>5%</u>		<u>facw+</u>	
4. <u>Triadenum fraseri</u>	<u>5%</u>		<u>obl</u>	
5. <u>Typha sp</u>	<u>2%</u>		<u>obl</u>	
6. _____				
7. <u>Spiraea alba</u>	<u>2%</u>		<u>fac</u>	
8. <u>Myrica pensylvanica</u>	<u>2%</u>		<u>fac</u>	
9. _____				
10. _____				
<u>120</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No _____
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point: WL-M1-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-40+	1.5YR7/1	75	Gley 1.5Y5/6.1	20	Rm	M	Sandy	Matrix is clayey sand
			2.5YR7/6	5	C	PL	Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

Histosol (A1)  Sandy Redox (S5)  
 Histic Epipedon (A2)  Polyvalue Below Surface (S8)  
 Black Histic (A3)  Thin Dark Surface (S9)  
 Hydrogen Sulfide (A4)  Loamy Gleyed Matrix (F2)  
 Stratified Layers (A5)  Depleted Matrix (F3)  
 Depleted Below Dark Surface (A11)  Redox Dark Surface (F6)  
 Thick Dark Surface (A12)  Depleted Dark Surface (F7)  
 Sandy Mucky Mineral (S1)  Redox Depressions (F8)  
 Sandy Gleyed Matrix (S4)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

Coast Prairie Redox (A16)  
 5 cm Mucky Peat or Peat (S3)  
 Iron-Manganese Masses (F12)  
 Piedmont Floodplain Soils (F19)  
 Red Parent Material (TF2)  
 Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

<p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<p><u>Secondary Indicators (minimum of two required)</u></p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): 15cm  
 Saturation Present? Yes  No  Depth (inches): 0cm  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

LWL 15

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Brat Harbour Municipality/County: Pictou Sampling Date: Sept. 8, 2015  
 Applicant/Owner: NS Lands Sampling Point: WLM1-4P  
 Investigator(s): C. LaPlante Affiliation: WSF  
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None  
 Slope (%): \_\_\_\_\_ Lat: 52°56'48.717 Long: 52°26'43.42 Datum: NAD83  
 Soil Map Unit Name/Type: Shulie (Sua) Wetland Type: Upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Vegetation is borderline. Prevalence index would indicate upland.</u>	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>0.1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83%</u> (A/B)
1. <u>Acer rubrum</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Picea rubens</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Betula papyrifera</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>75</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Mirrica pennsylvanica</u>	<u>20%</u>	_____	<u>fac</u>	
2. <u>Vaccinium myrtillus</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Viburnum acerifolium</u>	<u>20%</u>	_____	<u>fac</u>	
4. <u>Kalmia angustifolia</u>	<u>5%</u>	_____	<u>fac</u>	
5. <u>Gaylussacia bacatta</u>	<u>2%</u>	_____	<u>fac</u>	
<u>96</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Carex canadensis</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Pteridium aquilinum</u>	<u>5%</u>	_____	<u>facu</u>	
3. <u>Trientalis borealis</u>	<u>2%</u>	_____	<u>fac</u>	
4. <u>Pyrola elliptica</u>	<u>1%</u>	_____	<u>fac</u>	
5. _____	_____	_____	_____	
6. <u>Gaultheria procumbens</u>	<u>50%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>28</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL**

Sampling Point: WLM1-4p

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5cm	7.5YR 2.5/2	100						Organic layer / roots
5-45cm	10YR 4/6	100					clay loam	well drained

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

recent heavy rains soil well drained

W46

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Sept 7 2011  
 Applicant/Owner: NS lands Sampling Point: WL-21-WL  
 Investigator(s): C. Laflamme B. Leights Affiliation: WSF  
 Landform (hillslope, terrace, etc.): Bottom Local relief (concave, convex, none): Concave  
 Slope (%): 0% Lat: 58°56'973.51 Long: 52°6'221.31 Datum: NAD83  
 Soil Map Unit Name/Type: Shulte (Su2) Wetland Type: Cattail marsh  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>9</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>78%</u> (A/B)
1. <u>Acer rubrum</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Tsuga canadensis</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
3. <u>Abies balsamea</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. <u>Betula populifolia</u>	<u>2%</u>		<u>fac</u>	
5. _____				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
= Total Cover <u>22</u>				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Tsuga canadensis</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>pacu</u>	
2. <u>Pinus strobus</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Betula populifolia</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. <u>Spicea tomentosa</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
5. _____				
= Total Cover <u>20</u>				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Scirpus atrocinctus</u>	<u>10%</u>		<u>facw</u>	
2. <u>Carex lurida</u>	<u>50%</u>	<input checked="" type="checkbox"/>	<u>obl</u>	
3. <u>Comarum palustre</u>	<u>5%</u>		<u>obl</u>	
4. <u>Calamagrostis canadensis</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
5. <u>Juncus effusus</u>	<u>15%</u>		<u>facw</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
= Total Cover <u>100</u>				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
= Total Cover _____				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Raining edge almost in water</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

**SOIL**

Sampling Point: WL-L1-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-40cm	7.5 YR 5/2	100%					Sandy clay	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)
	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
	<input type="checkbox"/> Iron-Manganese Masses (F12)
	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
	<input type="checkbox"/> Red Parent Material (TF2)
	<input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 20cm

Water Table Present? Yes  No  Depth (inches): 30cm

Saturation Present? Yes  No  Depth (inches): 0cm  
(includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

W46

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Sept 7/2017
Applicant/Owner: NS Lands Sampling Point: WL-L1-Up
Investigator(s): C. Laflamme, B. Leights Affiliation: WSP
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none
Slope (%): 25% Lat: 5056974.46 Long: 526711.48 Datum: NAD83
Soil Map Unit Name/Type: Chaotic (Su2) Wetland Type: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
Remarks: (Explain alternative procedures here or in a separate report.)
Vegetation is borderline. Prevalence index would indicate upland

VEGETATION – Use scientific names of plants.

Table with columns: Tree Stratum (Plot size: 10m), Sapling/Shrub Stratum (Plot size: 5m), Herb Stratum (Plot size: 1m), Woody Vine Stratum (Plot size: ...). Includes Dominance Test worksheet and Prevalence Index worksheet.

Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL**

Sampling Point: W-11-4p

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-7cm	7.5 YR 3/2						Silty	organic
7-35cm	7.5 YR 4/1	100					Loam	Dry

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks: \_\_\_\_\_

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Heavy rain, soil dry!

WL-17

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boal Harbour Municipality/County: Richou Sampling Date: Sept 8, 2019  
 Applicant/Owner: NS Lands Sampling Point: WLD-17  
 Investigator(s): C. T. Plamondon & Blights Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Bottom Local relief (concave, convex, none): Concave  
 Slope (%): \_\_\_\_\_ Lat: 50°56'10.76 Long: 52°6'009.96 Datum: \_\_\_\_\_  
 Soil Map Unit Name/Type: Skulie (Sua) Wetland Type: Freshwater Wetland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Thuja canadensis</u>	<u>10%</u>		<u>facu</u>	
2. <u>Acer rubrum</u>	<u>65%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Betula alleghaniensis</u>	<u>10%</u>		<u>fac</u>	
4. _____				
5. _____				
<u>85</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Abies balsamea</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. _____				
3. _____				
4. _____				
5. _____				
<u>15</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Onoclea sensibilis</u>	<u>50%</u>		<u>facw</u>	
2. <u>Rubus hispidus</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
3. <u>Polygonum lapathifolium</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. <u>Aralia nudicaulis</u>	<u>5%</u>		<u>fac</u>	
5. <u>Lycopodium uniflorum</u>	<u>10%</u>		<u>Facwt</u>	
6. <u>Impatiens capensis</u>	<u>10%</u>		<u>fac</u>	
7. _____				
8. _____				
9. _____				
10. _____				
<u>80</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No _____
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point: WL01-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5cm	7.5YR 2.5/1	100						Organic layer
5-20	6.5YR 5/10	90	10YR 5/6	10	C	M	Clay	
20-40	7.5YR 4/4	90	5YR 6/8	10	C	M	Sandy clay	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): 10 cm  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

WL-17

Project/Site: Port Harbour Municipality/County: Richmond Sampling Date: Sept. 8, 2017  
 Applicant/Owner: WS Lands Sampling Point: WLO1-UP  
 Investigator(s): C. LaPlante & B. Lighth Affiliation: WSP  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_  
 Slope (%): \_\_\_\_\_ Lat: 45° 68' 99.25" Long: 52° 60' 10.56" Datum: NAD83  
 Soil Map Unit Name/Type: Shulip (Su2) Wetland Type: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p align="center"><i>Vegetation is borderline. Prevalence index would indicate upland.</i></p>	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Betula alleghaniensis</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. <u>Tsuga canadensis</u>	<u>50%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. <u>Acer pensylvanicum</u>	<u>5%</u>		<u>facu</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75%</u> (A/B)
4. <u>Acer rubrum</u>	<u>10%</u>		<u>fac</u>	
5. _____				
<u>85</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Abies balsamea</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Tsuga canadensis</u>	<u>10%</u>		<u>facu</u>	OBL species _____ x 1 = _____
3. <u>Picea canadensis</u>	<u>5%</u>		<u>fac</u>	FACW species _____ x 2 = _____
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
<u>26</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Acalypha nudicaulis</u>	<u>2%</u>		<u>pac</u>	____ Rapid Test for Hydrophytic Vegetation
2. <u>Mniaristemon canadensis</u>	<u>2%</u>		<u>pac</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
3. <u>Trentalis borealis</u>	<u>2%</u>		<u>pac</u>	____ Prevalence Index is ≤3.0 <sup>1</sup>
4. <u>Cyperus debilis</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____				____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>16</u> = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. _____				Yes <input checked="" type="checkbox"/> No _____
2. _____				
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

**SOIL**

Sampling Point: WLO1-41A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Ab

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-30cm	10YR 4/2	100%					Organic	Duff layer
3-40cm	7.5YR 5/4	100%					Loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)
	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
	<input type="checkbox"/> Iron-Manganese Masses (F12)
	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
	<input type="checkbox"/> Red Parent Material (TF2)
	<input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if observed):</b> Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
Remarks:	

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)

<b>Field Observations:</b> Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
 Recent heavy rains. All drained

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 23, 2012
Applicant/Owner: NS Lands Sampling Point: WL1-UP
Investigator(s): Christina L. & Brady L. Affiliation: WSP
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none
Slope (%): Lat: 5057163.93 Long: 526366.07 Datum: NAD83 UTM20N
Soil Map Unit Name/Type: Shulie (Su1) Wetland Type: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
Remarks: (Explain alternative procedures here or in a separate report.)
Vegetation is borderline. Prevalence Index would indicate upland.

VEGETATION - Use scientific names of plants.

Table with columns for Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, Woody Vine Stratum, and Dominance Test worksheet. Includes species names like Tsuga canadensis, Abies balsamea, Acer rubrum, Betula papyrifera, and Aralia nudicaulis with their respective cover percentages and indicator statuses.

**SOIL**

Sampling Point: WJCI-4P

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-30cm	2.5YR 4/8	100					Silty loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_ (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dry

WL-180

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 28 2014  
Applicant/Owner: NS Lands Sampling Point: WLC1-WL  
Investigator(s): Christina L. & Bradley L. Affiliation: WASP  
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none  
Slope (%): \_\_\_\_\_ Lat: 5057166.79 Long: 526376.00 Datum: NAD83 UTM ZON  
Soil Map Unit Name/Type: Skulip (Su1) Wetland Type: Forested complex  
Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes  No \_\_\_\_\_  
Hydric Soil Present? Yes  No \_\_\_\_\_  
Wetland Hydrology Present? Yes  No \_\_\_\_\_  
Is the Sampled Area within a Wetland? Yes  No \_\_\_\_\_  
If yes, optional Wetland Site ID: \_\_\_\_\_  
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION – Use scientific names of plants.

Table with columns: Tree Stratum, Sapling/Shrub Stratum, Herb Stratum, Woody Vine Stratum, Absolute % Cover, Dominant Species?, Indicator Status, and Dominance Test worksheet. Includes handwritten entries for species like Acer rubrum, Betula papyrifera, and Carex crinita.

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WL01-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-20	10YR2/2	100%					Sandy	
20-50	2.5YR 4/6	100%					Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): 50 cm

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 2 cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

WL-186

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: 2019-02-27  
 Applicant/Owner: NS Lands Sampling Point: WL 81-WL  
 Investigator(s): W. L. + Bradley L. Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex  
 Slope (%): 5 Lat: 50°57'42.74 Long: 52°06'49.10 Datum: NAD83 UTM20N  
 Soil Map Unit Name/Type: Shulte (Su1) Wetland Type: Forested complex

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10 x 10</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Acer rubrum</u>	<u>70%</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Betula papyrifera</u>	<u>5%</u>	<input type="checkbox"/>	<u>FACU</u>	
3. <u>Abies balsamea</u>	<u>2%</u>	<input type="checkbox"/>	<u>FAC</u>	
4. <u>Picea rubens</u>	<u>2%</u>	<input type="checkbox"/>	<u>FAC</u>	
5. _____				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus incana</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. _____	_____	<input type="checkbox"/>	_____	
3. _____	_____	<input type="checkbox"/>	_____	
4. _____	_____	<input type="checkbox"/>	_____	
5. _____	_____	<input type="checkbox"/>	_____	
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0' <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Carex crinita</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
2. <u>Osmunda cinnamomea</u>	<u>20%</u>	<input type="checkbox"/>	<u>FAC</u>	
3. <u>Osmunda claytoniana</u>	<u>20%</u>	<input type="checkbox"/>	<u>FAC</u>	
4. <u>Ranunculus repens</u>	<u>5%</u>	<input type="checkbox"/>	<u>FAC</u>	
5. <u>Thelypteris palustris</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>OBL</u>	
6. _____	_____	<input type="checkbox"/>	_____	
7. _____	_____	<input type="checkbox"/>	_____	
8. _____	_____	<input type="checkbox"/>	_____	
9. _____	_____	<input type="checkbox"/>	_____	
10. _____	_____	<input type="checkbox"/>	_____	
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	<input type="checkbox"/>	_____	
2. _____	_____	<input type="checkbox"/>	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WLBI-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-35	7.5YR4/2	100%					Sandy Clay	
35-40+	7.5YR4/2	70%	7.5YR5/8	30%	C	M	Sand	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Red Parent Material (TF2)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): 38 cm

Saturation Present? Yes  No  Depth (inches): 0 cm  
(includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-18 b

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Port Harbour Municipality/County: Pictou Sampling Date: Aug 23 2011  
 Applicant/Owner: NS Lands Sampling Point: WLBI-UP  
 Investigator(s): Christina L. + Prady L Affiliation: WSP  
 Landform (hillslope, terrace, etc.): H slope Local relief (concave, convex, none): none  
 Slope (%): 5% Lat: 505413.24 Long: 526499.48 Datum: NAD83 UTM20N  
 Soil Map Unit Name/Type: Shulie (Su1) Wetland Type: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Vegetation borderline Prevalence Index would indicate more upland.</u>	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Acacia rubrum</u>	<u>70%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Populus tremuloides</u>	<u>10%</u>	<input type="checkbox"/>	<u>fac</u>	
3. <u>Betula papyrifera</u>	<u>2%</u>	<input type="checkbox"/>	<u>facu</u>	
4. <u>Picea rubens</u>	<u>5%</u>	<input type="checkbox"/>	<u>fac</u>	
5. _____	_____	_____	_____	
<u>87</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Viburnum nudum</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>5</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0' <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Pteridium aquilinum</u>	<u>1%</u>	<input type="checkbox"/>	<u>facu</u>	
2. <u>Oclemena acuminata</u>	<u>10%</u>	<input type="checkbox"/>	<u>facu</u>	
3. <u>Dennstaedtia punctilobula</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. <u>Urtica dioica</u>	<u>2%</u>	<input type="checkbox"/>	<u>fac</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>53</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WLBI-UP

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-40	S4P 4/6						Silty-loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

- Primary Indicators (minimum of one is required; check all that apply)
- Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)
  - Water-Stained Leaves (B9)
  - Aquatic Fauna (B13)
  - Marl Deposits (B15)
  - Hydrogen Sulfide Odor (C1)
  - Oxidized Rhizospheres on Living Roots (C3)
  - Presence of Reduced Iron (C4)
  - Recent Iron Reduction in Tilled Soils (C6)
  - Thin Muck Surface (C7)
  - Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

*dry soil*

WL-18c

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 23, 2017  
 Applicant/Owner: NS Lands Sampling Point: WLA1-WL  
 Investigator(s): Christina L. Brady L Affiliation: WSP  
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave  
 Slope (%): 2-5 Lat: 5059532.13 Long: 526731.32 Datum: NAD83 UTM ZON  
 Soil Map Unit Name/Type: Shulie (Su1) Wetland Type: forested  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Acer rubrum</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Populus grandidentata</u>	<u>15%</u>		<u>facu</u>	
3. _____				
4. _____				
<u>95</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Corylus cornuta</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Acer rubrum</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Alnus incana</u>	<u>3%</u>		<u>facu</u>	
<u>18</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Osmunda claytoniana</u>	<u>100%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Onoclea sensibilis</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
3. <u>Agrimonia striata</u>	<u>5%</u>		<u>fac</u>	
4. <u>Aralia nudicaulis</u>	<u>2%</u>		<u>fac</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>87</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Bare ground</u> <u>Red maple with a lot of sucker shoots</u>				

**SOIL**

Sampling Point: WLA1-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
20 cm	10YR 5/2	100					Clay	
20-50+	10YR 5/3	100					Sand	Small amount of redox

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Evidence of ponding. Dry at moment of observation  
Moist soil but not saturated

WL-180

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Pine Harbour Municipality/County: Pictou Sampling Date: Aug. 22, 2010  
 Applicant/Owner: NS Lands Sampling Point: WLA1-UP  
 Investigator(s): Christina L. + Brady L Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none  
 Slope (%): 25 Lat: 50°57'53.75 Long: 52°6'44.01 Datum: NAD83 UTM 20N  
 Soil Map Unit Name/Type: Shulte (Su4) Wetland Type: Upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Vegetation is borderline. Prevalence index would indicate more upland.</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
1. <u>Fraxinus americana</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	
2. <u>Acer rubrum</u>	<u>60%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Populus grandidentata</u>	<u>10%</u>		<u>facu</u>	
4. <u>Betula populifolia</u>	<u>2%</u>		<u>fac</u>	
<u>92</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Crataegus sp.</u>	<u>5%</u>		<u>-</u>	
2. <u>Fraxinus americana</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
3. <u>Rubus sp (Blackberry)</u>	<u>50%</u>		<u>-</u>	
4. <u>Cornus sericea</u>	<u>20%</u>		<u>facw</u>	
5. <u>Corylus cornuta</u>	<u>9%</u>		<u>fac</u>	
<u>27</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0' <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Tussilago farfara</u>	<u>28%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Osmunda cinnamomea</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Aralia nudicaulis</u>	<u>2%</u>		<u>fac</u>	
4. <u>Solidago rugosa</u>	<u>5%</u>		<u>fac</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>37</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Bare ground</u>				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WLA1-UP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
20cm	7.5YR4/3	100					Silty loam	Rocky
20-30f	7.5YR5/3	90%	7.5YR 4/6	10%	C	M	Clay loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>		<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dry soil, no staining of leaves

WL-19

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 14/17  
 Applicant/Owner: NS Lands Sampling Point: WL-C-WP  
 Investigator(s): MLD, DAB Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Bowl Local relief (concave, convex, none): Concave  
 Slope (%): 0 Lat: N 5057275.23 Long: E 527034.29 Datum: NAD 83  
 Soil Map Unit Name/Type: Shulie (Su1) Wetland Type: Treed forested swamp  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Acer rubrum</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. <u>Picea rubens</u>	<u>5%</u>		<u>fac</u>	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____				
5. _____				
<u>35</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Ilex verticillata</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Viburnum nudum</u>	<u>1%</u>		<u>fac</u>	OBL species _____ x 1 = _____
3. <u>Acer rubrum saplings</u>	<u>2%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	FACW species _____ x 2 = _____
4. _____				FAC species _____ x 3 = _____
5. _____				FACU species _____ x 4 = _____
<u>8</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. _____				<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2. _____				<input checked="" type="checkbox"/> Dominance Test is >50%
3. _____				<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
4. _____				<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>0</u> = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. _____				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				
<u>Sphagnum moss dominant. Leaf Litter with mud</u>				

**SOIL**

Sampling Point: WL-C-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <u>cm</u>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<u>0-41cm</u>	<u>10/R 2/1</u>	<u>100%</u>					<u>Silty</u>	<u>Organic</u>

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: roots  
 Depth (inches): 41cm

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): 13cm  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-19

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 14/17  
 Applicant/Owner: NS Lands Sampling Point: WL-C-48  
 Investigator(s): MLD, DAB Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex  
 Slope (%): 2% Lat: N 5057278.26 Long: E 527034.54 Datum: UTM 220N  
 Soil Map Unit Name/Type: Shulte (Su1) Wetland Type: Upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)			

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25%</u> (A/B)
1. <u>Acer rubrum</u>	<u>50%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	
2. <u>Picea rubens</u>	<u>10%</u>	<input type="checkbox"/>	<u>Fac</u>	
3. <u>Populus grandidentata</u>	<u>5%</u>	<input type="checkbox"/>	<u>Facu</u>	
4. _____	_____	<input type="checkbox"/>	_____	
5. _____	_____	<input type="checkbox"/>	_____	
65 = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Fagus grandifolia</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>Upl</u>	
2. <u>Acer rubrum</u>	<u>2%</u>	<input type="checkbox"/>	<u>Fac</u>	
3. <u>Acer pensylvanicum</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>Facu</u>	
4. <u>Abies balsamea</u>	<u>2%</u>	<input type="checkbox"/>	<u>Fac</u>	
5. <u>Pinus strobus</u>	<u>1%</u>	<input type="checkbox"/>	<u>Pac</u>	
6. <u>Quercus sp. sapling</u>	<u>1%</u>	<input type="checkbox"/>	_____	
16 = Total Cover				
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Cornus canadensis</u>	<u>5%</u>	<input type="checkbox"/>	<u>Fac</u>	
2. <u>Clintonia borealis</u>	<u>5%</u>	<input type="checkbox"/>	<u>Fac</u>	
3. <u>Maianthemum canadense</u>	<u>5%</u>	<input type="checkbox"/>	<u>Fac</u>	
4. <u>Gaultheria procumbens</u>	<u>3%</u>	<input type="checkbox"/>	<u>Fac</u>	
5. <u>Pteridium aquilinum</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>Facu</u>	
6. <u>Lilium sp.</u>	<u>2%</u>	<input type="checkbox"/>	_____	
7. _____	_____	<input type="checkbox"/>	_____	
8. _____	_____	<input type="checkbox"/>	_____	
9. _____	_____	<input type="checkbox"/>	_____	
10. _____	_____	<input type="checkbox"/>	_____	
30 = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	<input type="checkbox"/>	_____	
2. _____	_____	<input type="checkbox"/>	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				

**SOIL**

Sampling Point: IWL-C-4P

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <sup>1</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5cm	10YR 2/2	100%						organic root material
5-30cm	10YR 7/1	95%	10YR 3/8	5%	C	m	Sandy	
30-45cm	5YR 4/2	100%					Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)
	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
	<input type="checkbox"/> Iron-Manganese Masses (F12)
	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
	<input type="checkbox"/> Red Parent Material (TF2)
	<input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dry soil

WL-20c

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 14/17  
 Applicant/Owner: NS Lands Sampling Point: WL-A-WL  
 Investigator(s): MLD, DAB Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Bowl Local relief (concave, convex, none): Concave  
 Slope (%): 0 Lat: N 5057218.52 Long: E 527428.85 Datum: UTM 220N  
 Soil Map Unit Name/Type: Shulie (Sul) Wetland Type: Tall Riparian Swamp  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation U, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10 m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Betula alleghaniensis</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)  Total Number of Dominant Species Across All Strata: <u>8</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>63%</u> (A/B)
2. <u>Abies balsamea</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Betula papyrifera</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
4. <u>Betula populifolia</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
5. _____	_____	_____	_____	
<u>23</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>5m</u>)</b>				
1. <u>Viburnum nudum</u>	<u>3%</u>	<input type="checkbox"/>	<u>fac</u>	
2. <u>Populus tremuloides</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. <u>Alnus incana</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>18</u> = Total Cover				
<b>Herb Stratum (Plot size: <u>1m</u>)</b>				
1. <u>Onoclea sensibilis</u>	<u>70%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Doellingeria umbellata</u>	<u>5%</u>	<input type="checkbox"/>	<u>fac</u>	
3. <u>Equisetum sp</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
4. <u>Viola sp</u>	<u>2%</u>	<input type="checkbox"/>	<u>-</u>	
5. <u>Carex crinata</u>	<u>2%</u>	<input type="checkbox"/>	<u>obl</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>99</u> = Total Cover				
<b>Woody Vine Stratum (Plot size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WL-A-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <sup>cm</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-20cm	5YR 2.5/1	100%					silt	organics
20-47cm	7.5YR 5/3	100%					sandy silt	
47-56cm	2.5YR	80%	7.5YR 4/4	15%	C	M	silty clay	
			2.5YR 4/8	5%	C	PL	silty clay	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Polyvalue Below Surface (S8)	
<input type="checkbox"/> Thin Dark Surface (S9)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): 50cm

Saturation Present? Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-20c

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 14/17  
Applicant/Owner: NS Lands Sampling Point: WL-A-Up  
Investigator(s): MLD DAB Affiliation: WSP  
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex  
Slope (%): 3% Lat: N 5057219.78 Long: E 527438.82 Datum: UTM 220N  
Soil Map Unit Name/Type: Shutle (Su1) Wetland Type: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Populus tremuloides</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. <u>Fagus grandifolia</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>Upl</u>	Total Number of Dominant Species Across All Strata: <u>7</u> (B)
3. <u>Betula alleghaniensis</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>57%</u> (A/B)
4. <u>Acer rubrum</u>	<u>5%</u>		<u>fac</u>	
5. _____				
<u>65</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Fagus grandifolia</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>Upl</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Abies balsamea</u>	<u>5%</u>		<u>fac</u>	OBL species _____ x 1 = _____
3. <u>Acer pensylvanicum</u>	<u>1%</u>		<u>facu</u>	FACW species _____ x 2 = _____
4. <u>Quercus rubra</u>	<u>2%</u>		<u>facu</u>	FAC species _____ x 3 = _____
5. <u>Taxus canadensis</u>	<u>2%</u>		<u>fac</u>	FACU species _____ x 4 = _____
<u>35</u> = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: <u>1m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Convallaria majalis</u>	<u>1%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation
2. <u>Aralia nudicaulis</u>	<u>3%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
3. <u>Solidago rugosa</u>	<u>1%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>
4. _____				<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
<u>4</u> = Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____				
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WL-A-4P

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches) <sup>cm</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5cm	10YR 2/2	100%						Organic
5-25cm	2.5YR 4/4	100%					Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-21

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 25/17  
 Applicant/Owner: NS Lands Sampling Point: WL-N-WL  
 Investigator(s): MLD, ANF Affiliation: WSP  
 Landform (hillslope, terrace, etc.): bowl Local relief (concave, convex, none): Concave.  
 Slope (%): 0 Lat: N 5057275.44 Long: E 527448.65 Datum: UTM 220N  
 Soil Map Unit Name/Type: Shulie (Su1) Wetland Type: Tall Forested Swamp  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Betula alleghaniensis</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)	
2. <u>Acer rubrum</u>	<u>65%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
<u>105</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Abies balsamea</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>		<b>Hydrophytic Vegetation Indicators:</b> ___ Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% ___ Prevalence Index is ≤3.0 <sup>1</sup> ___ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
2. <u>Picea rubens</u>	<u>3%</u>	_____	<u>fac</u>		
3. <u>Fagus grandifolia</u>	<u>5%</u>	_____	<u>uPl</u>		
4. <u>Prunus virginiana</u>	<u>3%</u>	_____	<u>fac</u>		
5. <u>Acer rubrum</u>	<u>3%</u>	_____	<u>Fac</u>		
<u>29</u> = Total Cover					
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <u>Anaclea sensibilis</u>	<u>3%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. <u>Osmunda cinnamomea</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>fac</u>		
3. <u>Rubus idaeus</u>	<u>2%</u>	_____	<u>Fac</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
<u>15</u> = Total Cover					
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
_____ = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)					

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WL-D=WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2cm		100%						Organic root matter
2-12cm	10YR 2/1	100%					Sandy clay	
12-17cm	10YR 4/1	100%					Sandy	
17-29cm	7.5YR 4/3	100%					Sandy	
29-56cm	5YR 4/3	95%	5Y 5/1	5%	D	m	Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-21

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 25/14
Applicant/Owner: NS Lands Sampling Point: WL-N-Up
Investigator(s): MLD, ANF Affiliation: WSP
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none
Slope (%): 3% Lat: N 5057286.21 Long: E 527430.41 Datum: UTM 220N
Soil Map Unit Name/Type: Shulie (Sul) Wetland Type: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? No Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m) Absolute % Cover Dominant Species? Indicator Status
1. Tsuga Canadensis 80% [checked] facu
2. Betula alleghaniensis 15% fac
3. Acer saccharum 5% facu
4.
5.
100 = Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Abies balsamea 10% [checked] fac
2. Picea rubens 5% [checked] fac
3. Acer rubrum 3% fac
4.
5.
18 = Total Cover
Herb Stratum (Plot size: 1m)
1. Aralia nudicaulis 5% [checked] fac
2. Taxus canadensis 5% [checked] fac
3. Maianthemum canadense 1% fac
4. Osmunda cinnamomea 2% fac
5.
6.
7.
8.
9.
10.
13 = Total Cover
Woody Vine Stratum (Plot size: )
1.
2.
= Total Cover
Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)
Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators:
[checked] Rapid Test for Hydrophytic Vegetation
[checked] Dominance Test is >50%
[ ] Prevalence Index is <=3.0^1
[ ] Morphological Adaptations^1 (Provide supporting data in Remarks or on a separate sheet)
[ ] Problematic Hydrophytic Vegetation^1 (Explain)
^1Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes [checked] No

**SOIL**

Sampling Point: WL-N-4P

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <sup>F<sup>m</sup></sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2cm								Organic
2-21cm	7.5YR 2.5/3	100%					Silty	
21-46cm	7.5YR 4/6	75%	7.5YR 4/4	30%	D	m	Silty	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-22a

### WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Port Harbour Municipality/County: Pictou Sampling Date: Aug 15/17  
 Applicant/Owner: NS Lands Sampling Point: WL-E-WL  
 Investigator(s): MLD, DAB Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Coastal Local relief (concave, convex, none): Concave  
 Slope (%): 0 Lat: N 5057955.21 Long: E 528197.99 Datum: UTM 220N  
 Soil Map Unit Name/Type: Hunsford (Hd2) Wetland Type: Tall forb marsh/salt marsh  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

#### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydic Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Explain alternative procedures here or in a separate report.) <u>Down stream of a dam which alters tidal fluctuations.</u>			If yes, optional Wetland Site ID: _____

#### VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. _____				
2. _____				
3. _____				
4. _____				
5. _____	<u>0</u> = Total Cover			<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
	<u>0</u> = Total Cover			<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Herb Stratum (Plot size: <u>1m</u> )				
1. <u>Typha latifolia</u>	<u>70%</u>	<input checked="" type="checkbox"/>	<u>Obl</u>	
2. <u>Calystegia sepium</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
3. <u>Impatiens capensis</u>	<u>5%</u>		<u>FAC</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
	<u>100</u> = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____				
2. _____				
	_____ = Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point: WL-E-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-66 cm	10 R 2-5/1	100%					Sandy	Organic

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_ *over 1m deep*

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-22a

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Road Harbour Municipality/County: Pictou Sampling Date: Aug 15/17  
Applicant/Owner: NS Lands Sampling Point: WL-E-4P  
Investigator(s): MLD, DAB Affiliation: WSP  
Landform (hillslope, terrace, etc.): Coastal Sand dune Local relief (concave, convex, none): Convex  
Slope (%): 0 Lat: N 5057955.21 Long: E 528197.99 Datum: UTM20N  
Soil Map Unit Name/Type: Hansford (H22) Wetland Type: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No   
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Sand dunes downstream from dam</u>	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )				Prevalence Index worksheet:
1. <u>Rosa virginiana</u>	<u>3%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	Total % Cover of: _____ Multiply by: _____
2. _____	_____	_____	_____	OBL species _____ x 1 = _____
3. _____	_____	_____	_____	FACW species _____ x 2 = _____
4. _____	_____	_____	_____	FAC species _____ x 3 = _____
5. _____	_____	_____	_____	FACU species _____ x 4 = _____
3 = Total Cover				UPL species _____ x 5 = _____
Herb Stratum (Plot size: <u>1m</u> )				Column Totals: _____ (A) _____ (B)
1. <u>Lathyrus japonicus</u>	<u>15%</u>	_____	<u>Fac</u>	Prevalence Index = B/A = _____
2. <u>Rumex? sp</u>	<u>1%</u>	_____	_____	
3. <u>Fragaria vesca</u>	<u>2%</u>	_____	<u>Upl</u>	
4. <u>Lolium perenne</u>	<u>10%</u>	_____	<u>FacU</u>	
5. <u>Achillea millefolium</u>	<u>1%</u>	_____	<u>FacU</u>	
6. <u>Spartina sp</u>	<u>80%</u>	<input checked="" type="checkbox"/>	<u>Obl</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
109 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.)				

**SOIL**

Sampling Point: WL-E-KP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <small>cm</small>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10cm	10YR 5/3	100%					Sandy	
10-30cm	10YR 5/2	100%					Sandy	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> FAC-Neutral Test (D5)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-23a

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 16/17  
 Applicant/Owner: NS Lands Sampling Point: WL-H-WL  
 Investigator(s): MLD, DAB Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none  
 Slope (%): 0% Lat: N 5056766.99 Long: E 528182.14 Datum: UTM 220N  
 Soil Map Unit Name/Type: Hansford (H23) Wetland Type: Riparian marsh/swamp  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Betula populifolia</u>	<u>3%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>Acer rubrum</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>8</u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: <u>5m</u>)</b>				
1. <u>Spiraea tomatosa</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
2. <u>Alnus incana</u>	<u>5%</u>	_____	<u>facw</u>	
3. _____	_____	_____	_____	
<u>30</u> = Total Cover				
<b>Herb Stratum (Plot size: <u>1m</u>)</b>				
1. <u>Scirpus cyperinus</u>	<u>10%</u>	_____	<u>facw</u>	
2. <u>Iris versicolor</u>	<u>4%</u>	_____	<u>facw</u>	
3. <u>Typha latifolia</u>	<u>2%</u>	_____	<u>obl</u>	
4. <u>Juncus effusus</u>	<u>35%</u>	<input checked="" type="checkbox"/>	<u>facw</u>	
5. <u>Rubus sp.</u>	<u>10%</u>	_____	_____	
6. <u>Eupatorium perfoliatum</u>	<u>2%</u>	_____	<u>facw</u>	
7. <u>Solidago canadensis</u>	<u>1%</u>	_____	<u>fac</u>	
8. <u>Persicaria arifolia</u>	<u>1%</u>	_____	<u>obl</u>	
9. <u>Viola sp</u>	<u>1%</u>	_____	_____	
10. _____	_____	_____	_____	
<u>66</u> = Total Cover				
<b>Woody Vine Stratum (Plot size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Sphagnum moss</u>				

**SOIL**

Sampling Point: WL-H-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10cm	5YR 2.5/2	100%						Organic
10-35cm	10YR 6/2	80%	5YR 4/6	20%	C	PL	clay/silt	
35-41cm	10YR 6/1	70%	7.5YR 5/4	30%	C	M	clay/silt	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 22cm  
 Water Table Present? Yes  No  Depth (inches): 22cm  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WL-23a

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 16/17  
 Applicant/Owner: NS Lands Sampling Point: WL-H-up  
 Investigator(s): MLB, DAB Affiliation: WSP  
 Landform (hillslope, terrace, etc.): hill slope Local relief (concave, convex, none): convex  
 Slope (%): \_\_\_\_\_ Lat: N 5056773.56 Long: E 528184.93 Datum: UTM 22DN  
 Soil Map Unit Name/Type: Hantsford (Hd3) Wetland Type: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Acer rubrum</u>	<u>40%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. <u>Betula populifolia</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Total Number of Dominant Species Across All Strata: <u>7</u> (B)
3. <u>Abies balsamea</u>	<u>10%</u>		<u>fac</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86%</u> (A/B)
4. <u>Pinus strobus</u>	<u>3%</u>		<u>fac</u>	
5. _____				
<u>83</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet:
1. <u>Thuja occidentalis</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	Total % Cover of: _____ Multiply by: _____
2. <u>Abies balsamea</u>	<u>5%</u>		<u>fac</u>	OBL species _____ x 1 = _____
3. <u>Pinus strobus</u>	<u>10%</u>		<u>fac</u>	FACW species _____ x 2 = _____
4. <u>Picea rubens</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	FAC species _____ x 3 = _____
5. <u>Populus grandidentata</u>	<u>3%</u>		<u>facu</u>	FACU species _____ x 4 = _____
_____ = Total Cover				UPL species _____ x 5 = _____
				Column Totals: _____ (A) _____ (B)
				Prevalence Index = B/A = _____
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Rhododendron canadense</u>	<u>1%</u>		<u>fac</u>	____ Rapid Test for Hydrophytic Vegetation
2. <u>Viburnum nudum</u>	<u>5%</u>		<u>fac</u>	<input checked="" type="checkbox"/> Dominance Test is >50%
3. _____	<u>19</u>	<u>total</u>		____ Prevalence Index is ≤3.0 <sup>1</sup>
4. <u>Herb Stratum 2m<sup>2</sup></u>				____ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
5. _____				____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
6. <u>Cornus canadensis</u>	<u>3%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
7. <u>Trientalis borealis</u>	<u>1%</u>		<u>fac</u>	
8. <u>Maianthemum canadense</u>	<u>3%</u>	<input checked="" type="checkbox"/>	<u>fac</u>	
9. <u>Pteridium aquilinum</u>	<u>5%</u>	<input checked="" type="checkbox"/>	<u>facu</u>	
10. _____				
<u>12</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present?
1. _____				Yes <input checked="" type="checkbox"/> No _____
2. _____				
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2011)

**SOIL**

Sampling Point: WL-H-ESP

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-15 cm	7.5YR 2.5/2	100%					organic peat	
15-35 cm	7.5YR 5/4	100%					silty sand	fine sand
35-42 cm	10YR 6/2	90%	7.5YR 7/8	C	m		silty sand	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
<b>Primary Indicators (minimum of one is required; check all that apply)</b>			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> FAC-Neutral Test (D5)	

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No  Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dry Soil

WL-24

WETLAND DELINEATION DATA FORM – NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24, 2017
Applicant/Owner: NS Lands Sampling Point: WL-E1-85L
Investigator(s): C. LaFlamme, B. Leights Affiliation: WSP
Landform (hillslope, terrace, etc.): Base of slope Local relief (concave, convex, none): none
Slope (%): 0 Lat: N 5056389.55 Long: E 527579.62 Datum: NAD83 UTM70N
Soil Map Unit Name/Type: Hanford (H03) Wetland Type: Marsh complex

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes [checked] No
Wetland Hydrology Present? Yes [checked] No
Is the Sampled Area within a Wetland? Yes [checked] No
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m) Absolute % Cover 50% Dominant Species? [checked] Indicator Status fac
1. Betula populifolia
2.
3.
4.
5.
= Total Cover 50
Sapling/Shrub Stratum (Plot size: 5m) Absolute % Cover 10% Dominant Species? [checked] Indicator Status fac
1. Spiraea alba
2.
3.
4.
5.
= Total Cover 10
Herb Stratum (Plot size: 1m) Absolute % Cover 78% Dominant Species? [checked] Indicator Status facw
1. Onoclea sensibilis
2. Typha sp.
3. Juncus effusus
4. Triadenum fraseri
5. Scirpus atrocinctus
6. Impatiens capensis
7. Osmunda cinnamomea
8.
9.
10.
= Total Cover 78
Woody Vine Stratum (Plot size: ) Absolute % Cover 0% Dominant Species? [checked] Indicator Status fac
1.
2.
= Total Cover 0
Remarks: (Include photo numbers here or on a separate sheet.)
Sphagnum moss layer

**SOIL**

Sampling Point: WL-E1-WL

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches) <small>cm</small>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<i>0-10cm</i>								<i>sphagnum moss</i>
<i>10-30cm</i>	<i>10YR 3/3</i>	<i>70%</i>	<i>10YR 4/1</i>	<i>30%</i>	<i>Rm</i>	<i>m</i>	<i>Clay/sand</i>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.    <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input checked="" type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	
<input type="checkbox"/> Aquatic Fauna (B13)	
<input type="checkbox"/> Marl Deposits (B15)	
<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 0

Water Table Present? Yes  No  Depth (inches): 0

Saturation Present? Yes  No  Depth (inches): 0  
(includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
*Organic Top*

WL 24

**WETLAND DELINEATION DATA FORM – NOVA SCOTIA**

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Aug 24/2017  
 Applicant/Owner: NS Lands Sampling Point: WL-E1-9up  
 Investigator(s): C Laflamme, B. Leight Affiliation: WSP  
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none  
 Slope (%): 2% Lat: N 5056381.44 Long: E 527582.17 Datum: NAD 83 UTM ZON  
 Soil Map Unit Name/Type: Hansford (Hd3) Wetland Type: Upland  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)	

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10m</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
1. <u>Pinus strobus</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	
2. <u>Tsuga canadensis</u>	<u>2%</u>	<input type="checkbox"/>	<u>Pacu</u>	
3. <u>Betula populifolia</u>	<u>25%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	
4. <u>Acer rubrum</u>	<u>20%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	
5. <u>Picea glauca</u>	<u>10%</u>	<input type="checkbox"/>	<u>Fac</u>	
	<u>78</u> = Total Cover			Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5m</u> )				
1. <u>Myrica pensylvanica</u>	<u>30%</u>	<input checked="" type="checkbox"/>	<u>Fac</u>	
2. _____				
3. _____				
4. _____				
5. _____				
	<u>30</u> = Total Cover			
Herb Stratum (Plot size: <u>1m</u> )				Hydrophytic Vegetation Indicators: ___ Rapid Test for Hydrophytic Vegetation ___ Dominance Test is >50% ___ Prevalence Index is ≤3.0 <sup>1</sup> ___ Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Pteridium aquilinum</u>	<u>10%</u>	<input checked="" type="checkbox"/>	<u>Facu</u>	
2. <u>Cornus canadensis</u>	<u>2%</u>	<input type="checkbox"/>	<u>Fac</u>	
3. <u>Solidago nemoralis</u>	<u>15%</u>	<input checked="" type="checkbox"/>	<u>Upl</u>	
4. <u>Euthamia graminifolia</u>	<u>2%</u>	<input type="checkbox"/>	<u>Fac</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
	<u>29</u> = Total Cover			
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
1. _____				
2. _____				
	_____ = Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.) <u>Bare ground mostly</u>				

**SOIL**

Sampling Point: WRF1-4P

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Ah  
B

Depth (inches) <sup>2m</sup>	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5	7.5YR 2.5/4	100					silt	Organic Duff
5-55cm	10YR 5/6	100					Sandy loam	Coarse

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

- Primary Indicators (minimum of one is required; check all that apply)
- Surface Water (A1)
  - High Water Table (A2)
  - Saturation (A3)
  - Water Marks (B1)
  - Sediment Deposits (B2)
  - Drift Deposits (B3)
  - Algal Mat or Crust (B4)
  - Iron Deposits (B5)
  - Inundation Visible on Aerial Imagery (B7)
  - Sparsely Vegetated Concave Surface (B8)
  - Water-Stained Leaves (B9)
  - Aquatic Fauna (B13)
  - Marl Deposits (B15)
  - Hydrogen Sulfide Odor (C1)
  - Oxidized Rhizospheres on Living Roots (C3)
  - Presence of Reduced Iron (C4)
  - Recent Iron Reduction in Tilled Soils (C6)
  - Thin Muck Surface (C7)
  - Other (Explain in Remarks)

**Secondary Indicators (minimum of two required)**

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Drill

WL 25 wet

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Roat Harbour Municipality/County: Pictou Sampling Date: Nov 28/11
Applicant/Owner: Canada Lands Sampling Point: Wetland WL-25 Line SE of Effluent Line.
Investigator(s): MLD, LH Affiliation: WSP Canada Inc
Landform (hillslope, terrace, etc.): ponded area Local relief (concave, convex, none): concave
Slope (%): 0% Lat: 55 281.47mN Long: 52 5081.07mE E Datum: NAD83 UTM 2 20N
Soil Map Unit Name/Type: Hanford Hd 2/C Wetland Type: low shrub/swamp
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation N, Soil W, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes [checked] No
Hydric Soil Present? Yes [checked] No
Wetland Hydrology Present? Yes [checked] No
Is the Sampled Area within a Wetland? Yes [checked] No
If yes, optional Wetland Site ID: Wetland WL-23
Remarks: (Explain alternative procedures here or in a separate report.)
- Water ponded in wetland. Could have been caused in the past from excavation.

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m)
1.
2.
3.
4.
5.
= Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Ilex verticillata 15% [checked] facw+
2.
3.
4.
5.
= 15% = Total Cover
Herb Stratum (Plot size: 1m)
1. Asmundia cinnamomea 5% [checked] fac
2. Onoclea sensibilis 2% [checked] facw
3.
4.
5.
6.
7.
8.
9.
10.
= 7% = Total Cover
Woody Vine Stratum (Plot size: )
1.
2.
= Total Cover
Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)
Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators:
Rapid Test for Hydrophytic Vegetation [checked]
Dominance Test is >50% [checked]
Prevalence Index is <= 3.0^1
Morphological Adaptations^1 (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation^1 (Explain)
^1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes [checked] No

WL-25

SOIL

Sampling Point: \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10cm	10YR2/1	BS	10YR6/3	15			SILTY	organic
10-70cm	7.5YR2.5/1	100%					silty	organic

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- Coast Prairie Redox (A16)
- 5 cm-Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none  
 Depth (inches): 70cm+

Hydric Soil Present? Yes  No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes  No  Depth (inches): 30cm  
 Water Table Present? Yes  No  Depth (inches): 0cm  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0cm

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

- ponded water, alot of bare ground (see pics)

WL25 up

WETLAND DELINEATION DATA FORM - NOVA SCOTIA

Project/Site: Boat Harbour Municipality/County: Pictou Sampling Date: Nov 28/17
Applicant/Owner: Canada Lands Sampling Point: Effluent upland pt. (w25)
Investigator(s): MLO, LH Affiliation: WSP Canada Inc
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex
Slope (%): 2% Lat: 5055276.81m N Long: 525075.59m E Datum: UTM 220 N
Soil Map Unit Name/Type: Hanford Hd2/C Wetland Type:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes [checked] No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations; transects, important features, etc.

Hydrophytic Vegetation Present? Yes No [checked]
Hydric Soil Present? Yes No [checked]
Wetland Hydrology Present? Yes No [checked]
Is the Sampled Area within a Wetland? Yes No [checked]
If yes, optional Wetland Site ID:
Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 10m) Absolute % Cover Dominant Species? Indicator Status
1. Tsuga canadensis 50% [checked] facu
2. Betula papyrifera 15% [checked] facu
3. Fagus grandifolia 5% uel
4. Betula alleghaniensis 3% fac
73 = Total Cover
Sapling/Shrub Stratum (Plot size: 5m)
1. Tsuga canadensis 3% [checked] facu
2. Picea rubens 9% [checked] fac
5% = Total Cover
Herb Stratum (Plot size: 1m)
Woody Vine Stratum (Plot size: )
Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.25 (A/B)
Prevalence Index worksheet:
Total % Cover of: Multiply by:
OBL species x 1 =
FACW species x 2 =
FAC species x 3 =
FACU species x 4 =
UPL species x 5 =
Column Totals: (A) (B)
Prevalence Index = B/A =
Hydrophytic Vegetation Indicators:
Rapid Test for Hydrophytic Vegetation
Dominance Test is >50%
Prevalence Index is <=3.0^1
Morphological Adaptations^1 (Provide supporting data in Remarks or on a separate sheet)
Problematic Hydrophytic Vegetation^1 (Explain)
^1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Hydrophytic Vegetation Present? Yes No [checked]

WL-25

SOIL

Sampling Point: \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5cm	7.5YR2.5/2	100					organic/peat	dry
5-30cm	7.5YR 3/4	100					peat/silty	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)

- Sandy Redox (S5)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (TF2)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock / roots  
Depth (inches): 30 cm

Hydric Soil Present? Yes  No

Remarks: - soil crumbles in hands

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? Yes  No  Depth (inches): \_\_\_\_\_  
 (includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: - Dry no hydrology indicators

# APPENDIX

**D**

WETLAND FUNCTIONAL  
ASSESSMENT SHEETS

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 1, prev WL-D1
Investigator Name:	Christina Laflamme, Brady Leights
Date of Field Assessment:	24/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.660287
Longitude (decimal degrees):	-62.649279
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	1.28
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	24-Aug-17	Site Identifier: WL-1	Investigator: CL, BL	
<b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a> GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention & Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian & Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, & Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use & Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 1 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 1 0 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [ <i>This is nearly always the answer in relatively undeveloped landscapes.</i> ]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the <b>edge</b> of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and not separated. 50-500 m, but separated by those features. 0.5 - 5 km, and not separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	1 0 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	1	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]

OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is:		In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]
		<5% of the land.	0	
		5 to 20% of the land.	0	
		20 to 60% of the land.	0	
		60 to 90% of the land.	1	
>90% of the land. SKIP to OF10.	0			
OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock. bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0 1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool-> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[Fav, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler-Line tool. Or use the GeoNB's Draw Line tool. [AM, Fav, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
>500 m	1			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	1	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	0			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1	

OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column.	0.02	[NR, Sens, SFSv, WCv, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of <b>metals, hydrocarbons, nutrients</b> or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: The condition is present within the AA.	1	May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and: The condition is present within 1 km downslope and connected to the AA by a channel.	1	May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is: <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	[NR, PR, Sens, SR, WS]
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCv, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry>WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	1	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCv, WS]

OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> : is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlasc.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlasc.com/atlanticsalmon/canada-east/index.1.html</a>	0	Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably is not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]
OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called <b>NB Crown lands</b> .		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 24, 2017		Site Identifier: WL-1		Investigator: CL, BL	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~203 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>0</p>	<p>[PH, POL, SBM, Sens]</p>	

F5	Woody Diameter Classes	Mark ALL the types that comprise >5% of the woody canopy cover in the AA or >5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.		Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]
		coniferous, 1-9 cm diameter and >1 m tall.	0	
		broad-leaved deciduous 1-9 cm diameter and >1 m tall.	0	
		coniferous, 10-19 cm diameter.	0	
		broad-leaved deciduous 10-19 cm diameter.	0	
		coniferous, 20-40 cm diameter.	0	
		broad-leaved deciduous 20-40 cm diameter.	0	
		coniferous, >40 cm diameter.	0	
	broad-leaved deciduous >40 cm diameter.	0		
F6	Height Class Interspersion	Follow the key below and mark the ONE row that best describes MOST of the AA:		[AM, INV, NR, PH, SBM, Sens]
		A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise >70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.		
		A1. The two height classes are mostly scattered and intermixed throughout the AA.	0	
		A2. Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.	0	
		B. Either the vegetation shorter than 1 m comprises >70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:		
		B1. The less prevalent height class is mostly scattered and intermixed within the prevalent one.	0	
	B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.	0		
F7	Large Snags (Dead Standing Trees)	The number of large snags (diameter >20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:		Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]
		None, or fewer than 8/hectare which exceed this diameter.	0	
		Several (>8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.	0	
		Several (>8/hectare) but above not true.	0	
F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	0	
	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0		
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	1	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
	>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0		
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	1	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5% bare ground) is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	
		Intermediate.	0	
		Several (extensive micro-topography).	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are:		[AM, NR, SBM]
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	1	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	

F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: (include also any area that is adjacent to the AA).		This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
		1000 – 10,000 sq. m.	0	
		>10,000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		[AM, WBF, WBN]
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
>95% of the vegetated part of the AA.	1			
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	1	
		50-95% of the herbaceous part of the AA.	0	
>95% of the herbaceous part of the AA.	0			
F18	Sedge Cover	Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		[CS]
		<5% of the vegetated area, or none.	1	
		5-50% of the vegetated area.	0	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
F20	Invasive Plant Cover	those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		[EC, PH, POL, Sens]
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0			
invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0			
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	0	
		some (but <5% of the upland edge).	1	
		5-50% of the upland edge.	0	
most (>50%) of the upland edge.	0			
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	[WBF, WBN, WCv, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	1	[FR, PR, PU, WBF, WBN]
F24	% of AA Without Surface Water	The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]
		<1%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0	
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1	
		25-50% of the AA never contains surface water.	0	
		50-75% of the AA never contains surface water.	0	
75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0			
99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0			
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0	
		1-20% of the AA.	0	
		20-50% of the AA.	0	
		50-95% of the AA.	1	
>95% of the AA. True for many fringe wetlands.	0			
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]
		<5% of the water is shaded, or no surface water is present then.	0	
		5-25% of the water is shaded.	0	
		25-50% of the water is shaded.	0	
		50-75% of the water is shaded.	0	
>75% of the water is shaded.	1			

NoHerbCov

AllForbCov

AllSat2

AllSat1

NoPersis

AllWet

F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:			Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. <b>SKIP to F29.</b>	1			
		1-20% of the AA, or <1% but >0.01 ha.	0			
		20-50% of the AA.	0			
		50-95% of the AA.	0			
		>95% of the AA.	0			
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:			Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0			
		10 cm - 50 cm change.	0			
		0.5 - 1 m change.	0			
		1-2 m change.	0			
		>2 m change.	0			
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0			TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:			If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded. Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		<10 cm deep (but >0).	0			
		10 - 50 cm deep.	1			
		0.5 - 1 m deep.	0			
		1 - 2 m deep.	0			
		>2 m deep. True for many fringe wetlands.	0			
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):			Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1			
		One depth class that comprises 50-90% of the AA's inundated area.	0			
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0			
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:			Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. <b>SKIP to F34.</b>	0			
		5-30% of the water.	0			
		30-70% of the water.	0			
		70-95% of the water.	0			
		>95% of the water.	1			
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and <b>SKIP to F41</b> (Floating Algae & Duckweed).	1		Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submerged beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:			[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and <b>SKIP to F41</b> (Floating Algae & Duckweed).	1			
		1-4% of the ponded water. Enter "1" and <b>SKIP to F40</b> (Floating Algae & Duckweed).	0			
		5-30% of the ponded water.	0			
		30-70% of the ponded water.	0			
		70-99% of the ponded water.	0			
		100% of the ponded water.	0			AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:			"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0			
		1 - 9 m	0			
		10 - 29 m	0			
		30 - 49 m	0			
		50 - 100 m	0			
				> 100 m, or open water is absent at that time.		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:			If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0			
		1-25% of the water edge.	0			
		25-50% of the water edge.	0			
		50-75% of the water edge.	0			
				>75% of the water edge.		
F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:			Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. <b>SKIP to F38.</b>	0			
		1-25% of the emergent vegetation.	0			
		25-75% of the emergent vegetation.	0			
				>75% of the emergent vegetation.		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:			[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0			
		Intermediate.	0			
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0			
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and <b>SKIP to F42</b> (Connection).	0			DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:			For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0			
		Intermediate.	0			
				Extensive.		

F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: <u>Note</u> : If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCv, WS]	
		persistent (surface water flows out for >9 months/year).	1		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. <b>SKIP to F47 (pH)</b>	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water: mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features. is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0	"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	OutNone1 Outnone
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, <b>SKIP to F47 (pH Measurement)</b> .	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCv]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
F47	pH Measurement	The pH in most of the AA's surface water: was measured, and is: [enter the reading in the column to the right]; was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g. Labrador tea) are prevalent. Enter "1". neither of above. Enter "1".	0	Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row].			
		Conductivity is [enter the reading in µS/cm in the column to the right].			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE): evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1	[FA, FR, PH, SBM, Sens, WBF, WBN]	
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
F51	Internal Gradient	The gradient along most of the flow path within the AA is: <2% or the AA has no surface water outlet (not even seasonally) 2-5% 6-10% >10%	1	This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation (except lawns, row crops, heavily grazed land, conifer plantations) is: <5% 5 to 30% 30 to 60% 60 to 90% >90%, or all the area within 30 m of the AA edge is other wetlands. <b>SKIP to F55.</b>	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		0	
		0	
		0	
		0	
		1	
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): impervious surface, e.g., paved road, parking lot, building, exposed rock. bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		0	
		0	
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of: <1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands. 2-5% 5-30% >30%	[NRv, PRv, Sens, SRv]
		0	
		0	
		0	
		0	
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	Do not include upturned trees as potential den sites. [POL, SBM]
		0	
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): No. yes, and created or expanded 20 - 100 years ago. yes, and created or expanded 3-20 years ago. yes, and created or expanded within last 3 years. yes, but time of origin or expansion unknown. unknown if new or expanded within 20 years or not.	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		0	
		0	
		0	
		0	
		0	
		1	
F57	Burn History	More than 1% of the AA's previously vegetated area: burned within past 5 years. burned 6-10 years ago. burned 11-30 years ago. burned >30 years ago, or no evidence of a burn and no data.	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		0	
		0	
		0	
		1	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is: <25% 25-50% >50%	[PU, STR, WBFv]
		1	
		0	
		0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists: For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets. Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters. Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	[PU, STR]
		0	
		0	
		0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: <i>[Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]</i> <5% and no inhabited building is within 100 m of the AA. <5% and inhabited building is within 100 m of the AA. 5-50% and no inhabited building is within 100 m of the AA. 5-50% and inhabited building is within 100 m of the AA. 50-95%, with or without inhabited building nearby. >95% of the AA with or without inhabited building nearby.	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		0	
		0	
		0	
		0	
		0	
		1	
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i> . <5%. If F61 was answered ">95%" (mostly never visited), <b>SKIP to F65.</b> 5-50% 50-95% >95% of the AA.	[AM, PH, PU, SBM, STR, WBF, WBN]
		1	
		0	
		0	
		0	
		0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	[PH, PU]
		0	
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	[AM, PU, WBF, WBN]
		0	
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. low-impact commercial timber harvest (e.g., selective thinning). commercial or traditional-use harvesting of native plants, their fruits, or mushrooms. waterfowl hunting. fishing. trapping of furbearers. none of the above.	[FAv, FRv, WBFv]
		0	
		0	
		0	
		0	
		0	
		0	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are: Within 0-100 m of the AA. 100-500 m away. >500 m away, or no information.	[NRv]
		0	
		0	
		1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SupplInfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	[PH, PR]
		0	

BuffAllNat

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

				Data	
S1	<b>Aberrant Timing of Water Inputs</b>				
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>				
	stormwater from impervious surfaces that drains directly to the wetland				
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation				1
	regular removal of surface or groundwater for irrigation or other consumptive use				
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland				
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)				1
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch				
	artificial drains or ditches in or near the wetland				
	accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)				
	logging within the wetland				
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles				
	straightening, ditching, dredging, and/or lining of tributary channels				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
			Severe (3 points)	Medium (2 points)	Mild (1 point)
Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	2	
When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	1	
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					
Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	1	
Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	1	
			Sum=	5	
			Final Score=	0.42	
S2	<b>Accelerated Inputs of Contaminants and/or Salts</b>				
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities				1
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/ gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrnp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrnp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )				1
	road salt				
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
			Severe (3 points)	Medium (2 points)	Mild (1 point)
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed farm/ pipeline or transmission rights-of-way	low density residential	3
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3	
			Sum=	9	
			Final Score=	1.00	
S3	<b>Accelerated Inputs of Nutrients</b>				
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRv, PRv, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills				1
	fertilizers applied to lawns, ag lands, or other areas in the CA				
	livestock, dogs				
	artificial drainage of upslope lands				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
			Severe (3 points)	Medium (2 points)	Mild (1 point)
Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2	
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3	
			Sum=	8	
			Final Score=	0.89	

S4	<b>Excessive Sediment Loading from Contributing Area</b>					
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>					
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires					
	erosion from construction, in-channel machinery in the CA					
	erosion from off-road vehicles in the CA					
	erosion from livestock or foot traffic in the CA					
	stormwater or wastewater effluent					1
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction					
	accelerated channel downcutting or headcutting of tributaries due to altered land use					
	other human-related disturbances within the CA					
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA		extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	1
	Recentness of significant soil disturbance in the CA		current & ongoing	1-12 months ago	>1 yr ago	1
	Duration of sediment inputs to the wetland		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3
AA proximity to actual or potential sources		0 - 15 m	15-100 m	in more distant part of contributing area	3	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment						
				Sum=	8	
				Final Score=	0.67	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>					
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>					
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods					
	leveling or other grading not to the natural contour					
	tillage, plowing (but excluding disking for enhancement of native plants)					
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland					
	excavation					
	ditch cleaning or dredging in or adjacent to the wetland					
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments					
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil		>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration		long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration		frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
				Sum=	0	
				Final Score=	0.00	

Wetland ID:	WL-1
Date:	8/24/17
Observer:	Christina LaFlamme and Brady Leights
Latitude & Longitude (decimal degrees):	45.660287; -62.649279

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

<i>Results for this Assessment Area (AA):</i>						
<b>Wetland Functions or Other Attributes:</b>	<b>Function Score (Normalised)</b>	<b>Function Rating</b>	<b>Benefits Score (Normalised)</b>	<b>Benefits Rating</b>	<b>Function Score (raw)</b>	<b>Benefits Score (raw)</b>
Water Storage & Delay (WS)	0.71	Lower	0.00	Lower	2.07	0.05
Stream Flow Support (SFS)	4.79	Moderate	1.28	Moderate	2.56	0.95
Water Cooling (WC)	5.92	Higher	1.59	Lower	3.94	1.03
Sediment Retention & Stabilisation (SR)	0.81	Lower	10.00	Higher	3.51	10.00
Phosphorus Retention (PR)	1.27	Lower	10.00	Higher	4.60	10.00
Nitrate Removal & Retention (NR)	1.57	Lower	10.00	Higher	4.63	10.00
Carbon Sequestration (CS)	3.77	Moderate			6.09	
Organic Nutrient Export (OE)	6.47	Higher			5.13	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	4.54	Moderate	5.97	Moderate	5.09	4.50
Amphibian & Turtle Habitat (AM)	9.80	Higher	5.36	Moderate	8.58	4.96
Waterbird Feeding Habitat (WBF)	8.19	Higher	3.33	Moderate	6.57	3.33
Waterbird Nesting Habitat (WBN)	8.32	Higher	3.33	Moderate	6.89	3.33
Songbird, Raptor, & Mammal Habitat (SBM)	6.03	Moderate	3.33	Moderate	4.99	3.33
Pollinator Habitat (POL)	6.26	Moderate	3.33	Moderate	5.19	3.33
Native Plant Habitat (PH)	2.69	Lower	5.19	Moderate	4.56	4.50
Public Use & Recognition (PU)			2.60	Moderate		2.18
Wetland Sensitivity (Sens)			2.51	Lower		2.98
Wetland Ecological Condition (EC)			4.48	Moderate		6.67
Wetland Stressors (STR) (higher score means more stress)			7.78	Higher		4.71
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	0.71	Lower	0.00	Lower	2.07	0.05
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	1.63	Lower	10.00	Higher	5.40	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	5.30	Moderate	4.28	Moderate	4.66	3.33
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	8.35	Higher	5.69	Moderate	6.49	3.64
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	4.26	Moderate	4.21	Lower	5.05	4.11
WETLAND CONDITION (EC)			4.48	Moderate		6.67
WETLAND RISK (average of Sensitivity & Stressors)			6.06	Moderate		3.84

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-2a,b,c Previously WLF1-1, WLG1-1, WLH1-1
Investigator Name:	Christina LaFlamme & Brady Leights
Date of Field Assessment:	24/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.657270
Longitude (decimal degrees):	-62.649195
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	1.50
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date: 24-Aug-17 Site Identifier: WL-2a,b,c (Previously WLF1-1, WLG1-1, WLH 1-1)		Investigator: Christina LaFlamme & Brady Leights		
<p><b>Form OF (Office), Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:            Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>            GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>            For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one.		This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
		New Brunswick	0	
		Nova Scotia	1	
		Prince Edward Island	0	
		Newfoundland-Labrador	0	
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is:		"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
		<0.01 hectare (about 10 m x 10 m)	0	
		0.01 - 0.1 hectare	1	
		0.1 - 1 hectare	0	
		1 to 10 hectares	0	
		10 to 100 hectares	0	
		>100 hectares	0	
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is:		See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
		<0.01 hectare (about 10 m x 10 m)	0	
		0.01 - 0.1 hectare	1	
		0.1 - 1 hectare	0	
		1 to 10 hectares	0	
		10 to 100 hectares	0	
		>100 hectares	0	
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is:		See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
		<0.01 hectare (about 10 m x 10 m)	0	
		0.01 - 0.1 hectare	0	
		0.1 - 1 hectare	0	
		1 to 10 hectares	0	
		10 to 100 hectares	1	
		100 to 1000 hectares	0	
		>1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0	
OF5	Distance to Large Vegetated Tract	The minimum distance from the <b>edge</b> of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is:		To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
		<50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes].	1	
		<50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 5 km, and not separated.	0	
		0.5 - 5 km, but separated by those features.	0	
none of the above (the closest patches or corridors which are that large are >5 km away).	0			
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	1	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is:		In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]
		<5% of the land.	0	
		5 to 20% of the land.	0	
		20 to 60% of the land.	0	
		60 to 90% of the land.	1	
>90% of the land. SKIP to OF10.	0			

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured <b>along</b> the maintained road nearest the AA, the distance to the nearest <b>population center</b> is:		"Population center" means a settled area with more than about 5 regularly inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool- Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the <b>center</b> of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
>500 m	1			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is <b>larger than 8 hectares</b> is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest <b>tidal water</b> body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	1	
		1 - 5 km	0	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is <b>no infrastructure</b> vulnerable to river flooding unrelated to tidal storm surges.	1			
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.04	[NR, Sens, SFSv, WCv, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]

OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of <b>metals, hydrocarbons, nutrients</b> , or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	1	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	1	
		100 - 1000 m	0	
		1- 2 km, or wetland lacks an inlet and/or outlet.	0	
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	[AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: [mark just the first choice that is true]:		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have other fish at least seasonally.	0	
OF29	Species of Conservation Concern	is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
		Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented [mark all applicable]:		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, Phv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the amphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the waterbird species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file.	0	
Presence of one or more of the nestling songbird or raptor species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file, during their nesting season (May-July for most species).	0			
none of the above, or no data.	0			

OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]
OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called <b>NB Crown lands</b> .		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	0	

Date: August 24, 2017		Site Identifier: WL-2a,b,c (Previously WLF1-1, WLG1-1, WLH1-1)		Investigator: Christina LaFlamme & Brady Leights	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>3</p> <p>0</p> <p>1</p> <p>0</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>1</p> <p>0</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>1</p> <p>0</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	

F7	Large Snags (Dead Standing Trees)	The number of large snags (diameter >20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:		Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]
		None, or fewer than 8/hectare which exceed this diameter.	1	
		Several (>8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.	0	
		Several (>8/hectare) but above not true.	0	
F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	0	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	1	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Not applicable: Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
		Intermediate.	0	
F13	Upland Inclusions	Several (extensive micro-topography).	1	[AM, NR, SBM]
		Within the AA, inclusions of upland are:		
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
F14	Soil Texture	Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual).]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
F15	Shorebird Feeding Habitats	Peat or organic <40 cm deep.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	1000 - 10,000 sq. m.	0	[AM, WBF, WBN]
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
F17	Forb Cover	25-50% of the vegetated part of the AA.	1	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	1	
F18	Sedge Cover	5-25% of the herbaceous part of the AA.	0	[CS]
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	0	
		>95% of the herbaceous part of the AA.	0	
		Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		
F19	Dominance of Most Abundant Herbaceous Species	<5% of the vegetated area, or none.	1	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		5-50% of the vegetated area.	0	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	

NoHerbCov

AllForbCov

F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		[EC, PH, POL, Sens]	
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1		
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0		
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0		
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0		
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]	
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1		
		some (but <5%) of the upland edge.	0		
		5-50% of the upland edge.	0		
		most (>50%) of the upland edge.	0		
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	[WBF, WBN, WCv, ]	
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	1	[FR, PR, PU, WBF, WBN]	
F24	% of AA Without Surface Water	The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
F25	% of AA with Persistent Surface Water	99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP TO F27.	0		
		1-20% of the AA.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
F26	% of Summertime Water that Is Shaded	>95% of the AA. True for many fringe wetlands.	0		
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	1		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	
		None, or <0.01 hectare and <1% of the AA. SKIP TO F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
F28	Annual Water Fluctuation Range	>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	1		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded.	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	1		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
F31	% of Water That Is Ponded (not Flowing)	Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP TO F34.	1		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	0		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP TO F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW

F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:	[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0	NoOpenPonded
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0	NoOpenPonded1
		5-30% of the ponded water.	0	
		30-70% of the ponded water.	0	
		70-99% of the ponded water.	0	
	100% of the ponded water.	0	AllOpenPond	
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:	"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	1	
		1 - 9 m	0	
		10 - 29 m	0	
		30 - 49 m	0	
		50 - 100 m	0	
	> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:	If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0	
		1-25% of the water edge.	0	
		25-50% of the water edge.	0	
		50-75% of the water edge.	0	
	>75% of the water edge.	1		
F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Zypha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:	Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0	
		1-25% of the emergent vegetation.	0	
		25-75% of the emergent vegetation.	0	
	>75%, of the emergent vegetation.	1		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:	[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0	
		Intermediate.	0	
	Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	1		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42 (Connection).	0	DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:	For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0	
		Intermediate.	0	
	Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]	Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	
		persistent (surface water flows out for >9 months/year).	0	
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0	
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0	
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement)	0	
	no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	1		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:	"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0	
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0	
	is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRV, PH, PR, SRV]
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].	[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0	
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0	
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0	
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0	
	bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:	Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA.	
		was measured, and is: [enter the reading in the column to the right]:	Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR,	
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0	
	neither of above. Enter "1".	1		

F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:		
		Conductivity is: [enter the reading in µS/cm in the column to the right]:		
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0	
		neither of above	1	
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0	
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	1	
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0	
F50	Groundwater Strength of Evidence	Select first applicable choice:		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0	
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0	
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1	
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than -1 km), this may be estimated using Google Earth to determine the elevation and distance of the inlet and outlet.
		<2% or the AA has no surface water outlet (not even seasonally)	1	
		2-5%	0	
		6-10%	0	
		>10%	0	
<b>Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.</b>				
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0	
		5 to 30%	0	
		30 to 60%	0	
		60 to 90%	0	
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1	
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):		[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0	
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0	
		2-5%	0	
		5-30%	0	
		>30%	0	
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0	
		yes, and created or expanded 20 - 100 years ago.	0	
		yes, and created or expanded 3-20 years ago.	0	
		yes, and created or expanded within last 3 years.	0	
		yes, but time of origin or expansion unknown.	0	
		unknown if new or expanded within 20 years or not.	1	
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0	
		burned 6-10 years ago.	0	
		burned 11-30 years ago.	0	
		burned >30 years ago, or no evidence of a burn and no data.	1	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]
		<25%	1	
		25-50%	0	
		>50%	0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1	
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0	
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]		[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0	
		<5% and inhabited building is within 100 m of the AA.	0	
		5-50% and no inhabited building is within 100 m of the AA.	0	
		5-50% and inhabited building is within 100 m of the AA.	0	
		50-95%, with or without inhabited building nearby.	0	
		>95% of the AA with or without inhabited building nearby.	1	

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F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i> .		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1	
		5-50%	0	
		50-95%	0	
		>95% of the AA.	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
		none of the above.	0	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Suppinfo file for list of plant indicators (calciphiles). Enter 1 if more than two <b>Strong</b> or more than five <b>Moderate</b> calciphile species are present; otherwise enter 0, but if not able to identify those and <b>no information, change to blank.</b>	0	[PH, PR]

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

				Data	
S1	<b>Aberrant Timing of Water Inputs</b>				
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>				
	stormwater from impervious surfaces that drains directly to the wetland				
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation				1
	regular removal of surface or groundwater for irrigation or other consumptive use				
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland				
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)				1
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch				
	artificial drains or ditches in or near the wetland				
	accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)				
	logging within the wetland				
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles				
	straightening, ditching, dredging, and/or lining of tributary channels				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	2
	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	1
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>				
	Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	1
	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	1
			<b>Sum=</b>	<b>5</b>	
			<b>Final Score=</b>	<b>0.42</b>	
S2	<b>Accelerated Inputs of Contaminants and/or Salts</b>				
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities				1
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;n=B85A1846-1</a> )				1
	road salt				
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission rights-of-way	low density residential	3
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3	
			<b>Sum=</b>	<b>9</b>	
			<b>Final Score=</b>	<b>1.00</b>	
S3	<b>Accelerated Inputs of Nutrients</b>				
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRv, PRv, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills				1
	fertilizers applied to lawns, ag lands, or other areas in the CA				
	livestock, dogs				
	artificial drainage of upslope lands				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2	
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3	
			<b>Sum=</b>	<b>8</b>	
			<b>Final Score=</b>	<b>0.89</b>	

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRV, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	1
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	1
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	3
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.67
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-2a,b,c (Previously WLF1-1, WLG1-1, WLH 1-1)
Date:	8/24/17
Observer:	Christina LaFlamme & Brady Leights
Latitude & Longitude (decimal degrees):	45.657270, -62.649195

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

<i>Results for this Assessment Area (AA):</i>						
<b>Wetland Functions or Other Attributes:</b>	<b>Function Score (Normalised)</b>	<b>Function Rating</b>	<b>Benefits Score (Normalised)</b>	<b>Benefits Rating</b>	<b>Function Score (raw)</b>	<b>Benefits Score (raw)</b>
Water Storage & Delay (WS)	7.44	Higher	0.00	Lower	7.44	0.10
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	7.10	Higher	0.00	Lower	4.73	0.00
Sediment Retention & Stabilisation (SR)	10.00	Higher	10.00	Higher	10.00	10.00
Phosphorus Retention (PR)	10.00	Higher	10.00	Higher	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	Higher	10.00	Higher	10.00	10.00
Carbon Sequestration (CS)	6.66	Higher			7.39	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	7.25	Higher	4.92	Moderate	6.24	3.96
Amphibian & Turtle Habitat (AM)	6.16	Moderate	6.02	Higher	6.72	5.41
Waterbird Feeding Habitat (WBF)	6.17	Higher	3.33	Moderate	4.95	3.33
Waterbird Nesting Habitat (WBN)	5.04	Moderate	3.33	Moderate	4.17	3.33
Songbird, Raptor, & Mammal Habitat (SBM)	9.60	Higher	3.33	Moderate	7.94	3.33
Pollinator Habitat (POL)	8.33	Higher	3.33	Moderate	6.90	3.33
Native Plant Habitat (PH)	3.67	Moderate	6.98	Higher	4.97	6.06
Public Use & Recognition (PU)			3.32	Moderate		2.69
Wetland Sensitivity (Sens)			7.00	Higher		4.42
Wetland Ecological Condition (EC)			6.32	Moderate		7.78
Wetland Stressors (STR) (higher score means more stress)			7.79	Higher		4.71
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	7.44	Higher	0.00	Lower	7.44	0.10
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	10.00	Higher	9.67	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	4.92	Moderate	3.05	Moderate	4.49	2.64
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	5.24	Moderate	6.21	Higher	4.94	3.91
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	8.70	Higher	5.27	Moderate	7.27	5.15
WETLAND CONDITION (EC)			6.32	Moderate		7.78
WETLAND RISK (average of Sensitivity & Stressors)			9.49	Higher		4.56

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 3
Investigator Name:	Brady Leights, Deborah Bear, Christina LaFlamme
Date of Field Assessment:	29/09/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.657180
Longitude (decimal degrees):	-62.655406
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	1.11
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	29-Sep-17	Site Identifier: Wetland 3	Investigator: BL, DB, CL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 1 0 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	1 0 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	1	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. <b>SKIP to OF10.</b>	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAV, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAV, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	1	
>500 m	0			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
0.5 - 1 km, but separated by those features.	0			
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	1	
		1 - 5 km	0	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1			
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.05	[NR, Sens, SFSv, WCv, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]

OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of <b>metals, hydrocarbons, nutrients</b> , or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow <b>into</b> the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	
OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRV, SRV]
		The condition is present within 1 km downslope and connected to the AA by a channel.	0	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	1	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRV, PRV, SRV, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRV, PRV, SRV, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The <b>overland flow</b> direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	1	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry>WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
		>2 km, or wetland lacks an inlet and/or outlet.	1	
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEL_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species).	0	
		none of the above, or no data.	1	

OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> . [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]
OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: 9/29/2017		Site Identifier: Wetland 3		Investigator: BL, DB, CL	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	Fen_ Marsh
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>1</p> <p>0</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>1</p> <p>0</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	

F7	Large Snags (Dead Standing Trees)	The number of large snags (diameter >20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:		Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]
		None, or fewer than 8/hectare which exceed this diameter.	1	
		Several (>8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.	0	
		Several (>8/hectare) but above not true.	0	
F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	1	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	1	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5% bare ground) is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Not applicable: Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	
		Intermediate.	0	
F13	Upland Inclusions	Several (extensive micro-topography).	0	[AM, NR, SBM]
		Within the AA, inclusions of upland are:		
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
F14	Soil Texture	Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual).]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt; soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
F15	Shorebird Feeding Habitats	Peat or organic <40 cm deep.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	1000 - 10,000 sq. m.	0	[AM, WBF, WBN]
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
F17	Forb Cover	25-50% of the vegetated part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		50-95% of the vegetated part of the AA.	1	
		>95% of the vegetated part of the AA.	0	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
F18	Sedge Cover	5-25% of the herbaceous part of the AA.	1	[CS]
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	0	
		>95% of the herbaceous part of the AA.	0	
		Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy:		
F19	Dominance of Most Abundant Herbaceous Species	<5% of the vegetated area, or none.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		5-50% of the vegetated area.	1	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	

NoHerbCov

AllForbCov

F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		[EC, PH, POL, Sens]	
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1		
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0		
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0		
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0		
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]	
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	0		
		some (but <5%) of the upland edge.	0		
		5-50% of the upland edge.	0		
		most (>50%) of the upland edge.	0		
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[WBF, WBN, WCv, ]	
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]	
F24	% of AA Without Surface Water	The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
F25	% of AA with Persistent Surface Water	75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	1		
		Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
F26	% of Summertime Water that is Shaded	20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		
		At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
F27	% of AA that is Flooded Only Seasonally	5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
		The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	
None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0				
F28	Annual Water Fluctuation Range	1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA.	0		
		The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
<10 cm change (stable or nearly so).	0				
F29	Predominant Depth Class	10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
		Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).	0		TooSmall
F30	Depth Classes - Evenness of Proportions	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded.	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
F31	% of Water That is Ponded (not Flowing)	>2 m deep. True for many fringe wetlands.	0		
		When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F32	Ponded Open Water - Minimum Size	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
F32	Ponded Open Water - Minimum Size	>95% of the water.	0		
		During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW

F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is <b>open</b> (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:	[AM, CS, FA, FR, INV, NR, OE, PR, SR, WB, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0	NoOpenPonded
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0	NoOpenPonded1
		5-30% of the ponded water.	0	
		30-70% of the ponded water.	0	
		70-99% of the ponded water.	0	
		100% of the ponded water.	0	AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <b>in the AA</b> that separates adjoining uplands from open water within the AA is:	"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0	
		1 - 9 m	0	
		10 - 29 m	0	
		30 - 49 m	0	
		50 - 100 m	0	
		> 100 m, or open water is absent at that time.	0	
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's <b>water edge</b> length that is <b>nearly flat</b> (a slope less than about 5% measured within 5 m landward of the water) is:	If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0	
		1-25% of the water edge.	0	
		25-50% of the water edge.	0	
		50-75% of the water edge.	0	
		>75% of the water edge.	0	
F36	Robust Emergents	The percentage of the <b>emergent vegetation</b> cover in the AA that is cattail ( <i>Zypha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:	<b>Emergent vegetation</b> is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. <b>SKIP to F38.</b>	0	
		1-25% of the emergent vegetation.	0	
		25-75% of the emergent vegetation.	0	
		>75%, of the emergent vegetation.	0	
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of <b>emergent</b> vegetation within the water is mostly:	[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WB, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0	
		Intermediate.	0	
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0	
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and <b>SKIP to F42</b> (Connection).	0	DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided <b>NOT</b> by living vegetation, but by accumulations of <b>dead wood and undercut banks</b> is:	For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0	
		Intermediate.	0	
		Extensive.	0	
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the <b>least</b> permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]	Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	
		persistent (surface water flows out for >9 months/year).	0	
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0	
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0	
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. <b>SKIP to F47 (pH)</b> no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. <b>SKIP to F47 (pH Measurement)</b> .	0	1
F43	Outflow Confinement	During <b>major runoff events</b> , in the places where <b>surface water</b> exits the AA or connected waters nearby, the water:	"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0	
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0	
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0	
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, <b>SKIP to F47 (pH Measurement)</b> .	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].	[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0	
		bumps into <b>herbaceous</b> vegetation but mostly remains in fairly straight channels.	0	
		bumps into <b>herbaceous</b> vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0	
		bumps into <b>tree trunks and/or shrub stems</b> but mostly remains in fairly straight channels.	0	
		bumps into tree trunks and/or shrub stems and follows a fairly <b>indirect</b> path from entrance to exit (meandering, multi-branched, or braided).	0	
F47	pH Measurement	The pH in most of the AA's surface water:	Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA.	
		was measured, and is: [enter the reading in the column to the right]:	Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR,	
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0	1

F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:		
		Conductivity is: [enter the reading in µS/cm in the column to the right]:		
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0	
		neither of above	1	
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0	
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0	
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1	
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0	
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0	
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1	
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than -1 km), this may be estimated using Google Earth to determine the elevation difference between the inlet and outlet.
		<2% or the AA has no surface water outlet (not even seasonally)	1	
		2-5%	0	
		6-10%	0	
		>10%	0	
<b>Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.</b>				
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0	
		5 to 30%	0	
		30 to 60%	0	
		60 to 90%	0	
>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1			
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):		[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0	
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0	
		2-5%	0	
		5-30%	0	
		>30%	0	
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0	
		yes, and created or expanded 20 - 100 years ago.	0	
		yes, and created or expanded 3-20 years ago.	0	
		yes, and created or expanded within last 3 years.	0	
		yes, but time of origin or expansion unknown.	0	
unknown if new or expanded within 20 years or not.	1			
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0	
		burned 6-10 years ago.	0	
		burned 11-30 years ago.	0	
		burned >30 years ago, or no evidence of a burn and no data.	1	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]
		<25%	1	
		25-50%	0	
		>50%	0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1	
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0	
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]		[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0	
		<5% and inhabited building is within 100 m of the AA.	0	
		5-50% and no inhabited building is within 100 m of the AA.	0	
		5-50% and inhabited building is within 100 m of the AA.	0	
		50-95%, with or without inhabited building nearby.	0	
		>95% of the AA with or without inhabited building nearby.	1	

TooSteep

BuffAINat

F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i> .		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), <b>SKIP to F65.</b>	1	
		5-50%	0	
		50-95%	0	
		>95% of the AA.	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
		none of the above.	0	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SupplInfo file for list of plant indicators (calciphiles). Enter 1 if more than two <b>Strong</b> or more than five <b>Moderate</b> calciphile species are present; otherwise enter 0, but if not able to identify those and <b>no information, change to blank.</b>	0	[PH, PR]

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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<b>S1</b>		<b>Aberrant Timing of Water Inputs</b>			
<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>					
stormwater from impervious surfaces that drains directly to the wetland					
water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation					
regular removal of surface or groundwater for irrigation or other consumptive use					
flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland					
a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)					
excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch					
artificial drains or ditches in or near the wetland					
accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)					
logging within the wetland					
subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles					
straightening, ditching, dredging, and/or lining of tributary channels					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of timing shift within the wetland		>95% of wetland	5-95% of wetland	<5% of wetland	0
When most of the timing shift began		<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					
Input timing now vs. previously		shift of weeks	shift of days	shift of hours or minutes	0
Flashiness or muting		became very flashy or controlled	intermediate	became mildly flashy or controlled	0
<b>Sum=</b>					<b>0</b>
<b>Final Score=</b>					<b>0.00</b>

<b>S2</b>		<b>Accelerated Inputs of Contaminants and/or Salts</b>			
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities					
metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/ gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/nrnp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/nrnp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )					
road salt					
spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Usual toxicity of most toxic contaminants		industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission right-of-way	low density residential	0
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
<b>Sum=</b>					<b>0</b>
<b>Final Score=</b>					<b>0.00</b>

<b>S3</b>		<b>Accelerated Inputs of Nutrients</b>			
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRv, PRv, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills					
fertilizers applied to lawns, ag lands, or other areas in the CA					
livestock, dogs					
artificial drainage of upslope lands					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Type of loading		high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	0
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
<b>Sum=</b>					<b>0</b>
<b>Final Score=</b>					<b>0.00</b>

S4	<b>Excessive Sediment Loading from Contributing Area</b>				
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
	erosion from construction, in-channel machinery in the CA				
	erosion from off-road vehicles in the CA				
	erosion from livestock or foot traffic in the CA				
	stormwater or wastewater effluent				
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
	accelerated channel downcutting or headcutting of tributaries due to altered land use				
	other human-related disturbances within the CA				
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0	
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment			Sum=	0	
			Final Score=	0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>				
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
	leveling or other grading not to the natural contour				
	tillage, plowing (but excluding disking for enhancement of native plants)				
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
	excavation				
	ditch cleaning or dredging in or adjacent to the wetland				
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0	
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
			Sum=	0	
			Final Score=	0.00	

Wetland ID:	Wetland 3
Date:	9/29/17
Observer:	Brady Leights, Deborah Bear, Christina LaFlamme
Latitude & Longitude (decimal degrees):	45.657180; -62.655406

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

<i>Results for this Assessment Area (AA):</i>						
<b>Wetland Functions or Other Attributes:</b>	<b>Function Score (Normalised)</b>	<b>Function Rating</b>	<b>Benefits Score (Normalised)</b>	<b>Benefits Rating</b>	<b>Function Score (raw)</b>	<b>Benefits Score (raw)</b>
Water Storage & Delay (WS)	8.26	Higher	0.00	Lower	8.09	0.13
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	0.00	Lower	0.00	Lower	0.00	0.00
Sediment Retention & Stabilisation (SR)	6.54	Higher	8.24	Higher	7.56	5.00
Phosphorus Retention (PR)	2.73	Moderate	5.16	Higher	5.50	5.00
Nitrate Removal & Retention (NR)	10.00	Higher	10.00	Higher	10.00	10.00
Carbon Sequestration (CS)	8.62	Higher			8.27	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	7.81	Higher	0.92	Moderate	6.48	1.88
Amphibian & Turtle Habitat (AM)	4.83	Moderate	2.26	Moderate	6.04	2.86
Waterbird Feeding Habitat (WBF)	0.00	Lower	0.00	Lower	0.00	0.00
Waterbird Nesting Habitat (WBN)	0.00	Lower	0.00	Lower	0.00	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	6.35	Moderate	3.33	Moderate	5.26	3.33
Pollinator Habitat (POL)	6.38	Moderate	3.33	Moderate	5.29	3.33
Native Plant Habitat (PH)	1.97	Lower	5.33	Moderate	4.27	4.63
Public Use & Recognition (PU)			2.01	Lower		1.76
Wetland Sensitivity (Sens)			4.75	Moderate		3.70
Wetland Ecological Condition (EC)			3.56	Moderate		6.11
Wetland Stressors (STR) (higher score means more stress)			2.25	Lower		2.34
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	8.26	Higher	0.00	Lower	8.09	0.13
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	8.72	Higher	8.92	8.33
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	3.88	Moderate	0.57	Lower	4.05	1.26
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	2.60	Lower	1.88	Moderate	3.62	1.72
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	4.39	Moderate	4.29	Lower	5.11	4.20
WETLAND CONDITION (EC)			3.56	Moderate		6.11
WETLAND RISK (average of Sensitivity & Stressors)			2.15	Lower		3.02

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 4
Investigator Name:	Christina LaFlamme, Brady Leights
Date of Field Assessment:	24/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.656058
Longitude (decimal degrees):	-62.653680
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	4.09
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	24-Aug-17	Site Identifier:WL-4	Investigator:CL, BL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 1 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	1 0 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	1	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
>500 m	1			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Ponded Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Ponded Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.028	[NR, Sens, SFSv, WCv, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1			

OF21	Degraded Water Downstream	The problem described above is <b>downslope from</b> the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	1	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEL_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	[AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a> <a href="http://atlanticsalmonfederation.org/rivers/introduction.html">http://atlanticsalmonfederation.org/rivers/introduction.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably is not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species), none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas.Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

42971	Site Identifier: WL-4		Investigator: CL, BL		
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	Fen_ Marsh
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>2</p> <p>2</p> <p>2</p> <p>3</p> <p>0</p> <p>2</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>1</p> <p>0</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	

F7	Large Snags (Dead Standing Trees)	The number of large snags (diameter >20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:		Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]
		None, or fewer than 8/ hectare which exceed this diameter.	1	
		Several (>8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.	0	
		Several (>8/hectare) but above not true.	0	
F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	0	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	1	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	1	
		50-95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Not applicable: Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
		Intermediate.	1	
F13	Upland Inclusions	Several (extensive micro-topography).	0	[AM, NR, SBM]
		Within the AA, inclusions of upland are:		
		Few or none.	0	
		Intermediate (1 - 10% of vegetated part of the AA).	1	
F14	Soil Texture	Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
F15	Shorebird Feeding Habitats	Peat or organic <40 cm deep.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	1000 - 10,000 sq. m.	0	[AM, WBF, WBN]
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
F17	Forb Cover	25-50% of the vegetated part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		50-95% of the vegetated part of the AA.	1	
		>95% of the vegetated part of the AA.	0	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
F18	Sedge Cover	5-25% of the herbaceous part of the AA.	0	[CS]
		25-50% of the herbaceous part of the AA.	1	
		50-95% of the herbaceous part of the AA.	0	
		>95% of the herbaceous part of the AA.	0	
		Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		
F19	Dominance of Most Abundant Herbaceous Species	<5% of the vegetated area, or none.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		5-50% of the vegetated area.	1	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		Those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
		Those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	

NoHerbCov

AllForbCov

F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		[EC, PH, POL, Sens]	
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1		
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0		
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0		
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0		
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species			If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1		
		some (but <5%) of the upland edge.	0		
		5-50% of the upland edge.	0		
		most (>50%) of the upland edge.	0		
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	[WBF, WBN, WCV, ]	
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]	
F24	% of AA Without Surface Water	The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:			1 hectare is 10 000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]
		<1% .In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
F25	% of AA with Persistent Surface Water	75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		
		Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:			If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	1		
F26	% of Summertime Water that is Shaded	20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		
		At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:			[FA, WC]
		<5% of the water is shaded, or no surface water is present then.	0		
F27	% of AA that is Flooded Only Seasonally	5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	1		
		>75% of the water is shaded.	0		
		The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:			Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]
F28	Annual Water Fluctuation Range	None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
		>95% of the AA.	0		
F29	Predominant Depth Class	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:			Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	1		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
F30	Evenness of Proportions	>2 m change.	0		
		Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).	0		TooSmall
		During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:			If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded.
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	1		
F31	% of Water That is Ponded (not Flowing)	0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
		When present, surface water in most of the AA usually consists of (select one):			Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
F32	Ponded Open Water - Minimum Size	One depth class that comprises 50-90% of the AA's inundated area.	1		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
		During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:			Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
F33	Ponded Open Water - Minimum Size	30-70% of the water.	0		
		70-95% of the water.	1		
		>95% of the water.	0		
		During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0		Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.
					OpenW

F33	% of Pondered Water that is Open	In ducks-eye aerial view, the percentage of the pondered water that is <b>open</b> (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded
		1-4% of the pondered water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		NoOpenPonded1
		5-30% of the pondered water.	0		
		30-70% of the pondered water.	0		
		70-99% of the pondered water.	0		
		100% of the pondered water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <b>in the AA</b> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's <b>water edge</b> length that is <b>nearly flat</b> (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		
F36	Robust Emergents	The percentage of the <b>emergent vegetation</b> cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		<b>Emergent vegetation</b> is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. <b>SKIP to F38.</b>	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75%, of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of <b>emergent</b> vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and <b>SKIP to F42</b> (Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided <b>NOT</b> by living vegetation, but by accumulations of <b>dead wood and undercut banks</b> is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore <b>by water depths &gt;1 m</b> on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	1	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the <b>least</b> permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonbt/e/DC/catalogue-E.asp">http://w.snb.ca/geonbt/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	1		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. <b>SKIP to F47</b> (pH Measurement).	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. <b>SKIP to F47</b> (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where <b>surface water</b> exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, <b>SKIP to F47</b> (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into <b>herbaceous</b> vegetation but mostly remains in fairly straight channels.	1		
		bumps into <b>herbaceous</b> vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into <b>tree trunks and/or shrub stems</b> but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly <b>indirect</b> path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		

F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
F50	Groundwater Strength of Evidence	Select first applicable choice:		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		
<b>Note for the next three questions:</b> If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.					
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]	
		<5%	0		
		5 to 30%	0		
		30 to 60%	0		
		60 to 90%	0		
>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1				
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):		[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]	
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0		
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0		
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]	
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0		
		2-5%	0		
		5-30%	0		
		>30%	0		
F55	Cliffs or Sleep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0	Do not include upturned trees as potential den sites. [POL, SBM]	
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]	
		No.	0		
		yes, and created or expanded 20 - 100 years ago.	0		
		yes, and created or expanded 3-20 years ago.	0		
		yes, and created or expanded within last 3 years.	0		
		yes, but time of origin or expansion unknown.	0		
unknown if new or expanded within 20 years or not.	1				
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]	
		burned within past 5 years.	0		
		burned 6-10 years ago.	0		
		burned 11-30 years ago.	0		
		burned >30 years ago, or no evidence of a burn and no data.	1		
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]	
		<25%	1		
		25-50%	0		
		>50%	0		
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]	
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1		
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0		
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0		
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]		[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]	
		<5% and no inhabited building is within 100 m of the AA.	0		
		<5% and inhabited building is within 100 m of the AA.	0		
		5-50% and no inhabited building is within 100 m of the AA.	0		
		5-50% and inhabited building is within 100 m of the AA.	0		
		50-95%, with or without inhabited building nearby.	0		
		>95% of the AA with or without inhabited building nearby.	1		

TooSteep

BuffAllNet

F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i> .		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), <b>SKIP to F65.</b>	1	
		5-50%	0	
		50-95%	0	
		>95% of the AA.	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
		none of the above.	0	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplinfo file for list of plant indicators (calciphiles). Enter 1 if more than two <b>Strong</b> or more than five <b>Moderate</b> calciphile species are present; otherwise enter 0, but if not able to identify those and <b>no information, change to blank.</b>	0	[PH, PR]

Investigator: CL, BL	Site Identifier: WL-4	Date: 24/08/2017	
<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>			
<b>S1</b>	<b>Aberrant Timing of Water Inputs</b>	<b>Data</b>	
<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>			
stormwater from impervious surfaces that drains directly to the wetland			
water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation			
regular removal of surface or groundwater for irrigation or other consumptive use			
flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland			
a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)			
excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch			
artificial drains or ditches in or near the wetland			
accelerated dewatering or channelization of an adjacent or internal channel (incised below the historical water table level)			
logging within the wetland			
subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles			
straightening, ditching, dredging, and/or lining of tributary channels			
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
	Severe (3 points)	Medium (2 points)	Mild (1 point)
Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland
When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>			
Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes
Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled
			Sum= 0
			Final Score= 0.00
<b>S2</b>	<b>Accelerated Inputs of Contaminants and/or Salts</b>	<b>Data</b>	
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>			
stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities			
metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )			
road salt			
spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA			
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
	Severe (3 points)	Medium (2 points)	Mild (1 point)
Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission rights-of-way	low density residential
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area
			Sum= 7
			Final Score= 0.78
<b>S3</b>	<b>Accelerated Inputs of Nutrients</b>	<b>Data</b>	
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>			
stormwater or wastewater effluent (including failing septic systems), landfills			
fertilizers applied to lawns, ag lands, or other areas in the CA			
livestock, dogs			
artificial drainage of upslope lands			
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
	Severe (3 points)	Medium (2 points)	Mild (1 point)
Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area
			Sum= 6
			Final Score= 0.67

S4	<b>Excessive Sediment Loading from Contributing Area</b>					
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>					
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires					
	erosion from construction, in-channel machinery in the CA					
	erosion from off-road vehicles in the CA					
	erosion from livestock or foot traffic in the CA					
	stormwater or wastewater effluent					
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction					
	accelerated channel downcutting or headcutting of tributaries due to altered land use					
	other human-related disturbances within the CA					
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA		extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA		current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0	
AA proximity to actual or potential sources		0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment						
				Sum=	0	
				Final Score=	0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>					
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>					
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods					
	leveling or other grading not to the natural contour					
	tillage, plowing (but excluding disking for enhancement of native plants)					
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland					
	excavation					
	ditch cleaning or dredging in or adjacent to the wetland					
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments					
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil		>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland		current & ongoing	1-12 months ago	>1 yr ago	0
Duration		long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0	
Timing of soil alteration		frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
				Sum=	0	
				Final Score=	0.00	

Wetland ID:	WL-4
Date:	24/08/2017
Observer:	Christina LaFlamme and Brady Leights
Latitude & Longitude (decimal degrees):	45.656058; -62.653680

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

<i>Results for this Assessment Area (AA):</i>						
<b>Wetland Functions or Other Attributes:</b>	<b>Function Score (Normalised)</b>	<b>Function Rating</b>	<b>Benefits Score (Normalised)</b>	<b>Benefits Rating</b>	<b>Function Score (raw)</b>	<b>Benefits Score (raw)</b>
Water Storage & Delay (WS)	3.80	Moderate	0.00	Lower	4.54	0.07
Stream Flow Support (SFS)	1.77	Lower	0.00	Lower	0.94	0.00
Water Cooling (WC)	3.42	Moderate	0.64	Lower	2.28	0.42
Sediment Retention & Stabilisation (SR)	2.86	Moderate	10.00	Higher	4.96	10.00
Phosphorus Retention (PR)	0.88	Lower	10.00	Higher	4.36	10.00
Nitrate Removal & Retention (NR)	4.30	Moderate	10.00	Higher	5.47	10.00
Carbon Sequestration (CS)	5.06	Moderate			6.67	
Organic Nutrient Export (OE)	4.89	Moderate			3.88	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	6.11	Moderate	2.29	Moderate	3.86	1.62
Aquatic Invertebrate Habitat (INV)	7.10	Higher	7.61	Higher	6.18	5.36
Amphibian & Turtle Habitat (AM)	8.96	Higher	6.54	Higher	8.15	5.76
Waterbird Feeding Habitat (WBF)	7.62	Higher	3.33	Moderate	6.11	3.33
Waterbird Nesting Habitat (WBN)	7.52	Higher	3.33	Moderate	6.22	3.33
Songbird, Raptor, & Mammal Habitat (SBM)	9.45	Higher	3.33	Moderate	7.82	3.33
Pollinator Habitat (POL)	8.45	Higher	3.33	Moderate	7.00	3.33
Native Plant Habitat (PH)	4.21	Moderate	6.98	Higher	5.19	6.05
Public Use & Recognition (PU)			1.81	Lower		1.62
Wetland Sensitivity (Sens)			3.04	Moderate		3.15
Wetland Ecological Condition (EC)			6.21	Moderate		7.71
Wetland Stressors (STR) (higher score means more stress)			3.02	Moderate		2.67
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	3.80	Moderate	0.00	Lower	4.54	0.07
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	3.25	Moderate	10.00	Higher	6.02	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	5.52	Moderate	4.84	Moderate	4.75	3.64
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	8.37	Higher	6.95	Higher	6.51	4.28
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	8.65	Higher	5.26	Moderate	7.25	5.15
WETLAND CONDITION (EC)			6.21	Moderate		7.71
WETLAND RISK (average of Sensitivity & Stressors)			1.63	Lower		2.91

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-5A,B, Boat Harbour Treatment Facility
Investigator Name:	Christina LaFlamme, Brady Leights
Date of Field Assessment:	25/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.653944
Longitude (decimal degrees):	-62.651459
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~7.5
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	25-Aug-17	Site Identifier: 5 A,B	Investigatc C. LaFlamme, B. Leights	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	1 0 0 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [ <i>This is nearly always the answer in relatively undeveloped landscapes.</i> ]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the <b>edge</b> of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and not separated. 50-500 m, but separated by those features. 0.5 - 5 km, and not separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	1 0 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	3	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
	>5 km	0		
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
	>500 m	1		
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	1	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
	>10 km	0		
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
	>40 km	0		
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
	More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	1		
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
	Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1		
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.049	[NR, Sens, SFSv, WCV, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	1	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
	Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	0		

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
OF24	Transport From Upslope	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[NRv, PRv, SRv, WSV]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF25	Aspect	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[AM, NR, SFS, WC, WS, ]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF26	Internal Flow Distance (Path Length)	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
		The horizontal flow distance from the wetland's inlet to outlet is:		
		<10 m	0	
10 - 50 m	0			
50 - 100 m	0			
100 - 1000 m	1			
1 - 2 km	0			
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]:</i>		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.		[SBM]

OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]
OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 25, 2017		Site Identifier: WL-11A,B		Investigator: C. LaFlamme, B. Leights	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	Fen_ Marsh
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>0</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/ hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>0</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is: Few or none that meet these criteria. Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0 0	Exclude temporary "burn piles." [AM, INV, POL, SBM]
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: <1% or none 1-25% of the vegetated cover, in the AA or along its water edge (whichever has more). 25-50% of the vegetated cover, in the AA or along its water edge (whichever has more). 50-75% of the vegetated cover, in the AA or along its water edge (whichever has more). >75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0 1 0 0 0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: <5% of the vegetated part of the AA. 5-25% of the vegetated part of the AA. 25-50% of the vegetated part of the AA. 50-95% of the vegetated part of the AA. >95% of the vegetated part of the AA.	0 1 0 0 0	Exclude moss growing on trees and rocks. [CS, PH]
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is: Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage. Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA. Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA. Other conditions. Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	1 0 0 0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is: Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered). Intermediate. Several (extensive micro-topography).	0 0 1	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
F13	Upland Inclusions	Within the AA, inclusions of upland are: Few or none. Intermediate (1 - 10% of vegetated part of the AA). Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0 1 0	[AM, NR, SBM]
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)] Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger. Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger. Peat, to 40 cm depth or greater. Peat or organic <40 cm deep. Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0 1 0 0 0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA]. none, or <100 sq. m. 100-1000 sq. m. 1000 - 10,000 sq. m. >10,000 sq. m.	1 0 0 0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is: <5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover). 5-25% of the vegetated part of the AA. 25-50% of the vegetated part of the AA. 50-95% of the vegetated part of the AA. >95% of the vegetated part of the AA.	0 1 0 0 0	[AM, WBF, WBN]
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of: <5% of the herbaceous part of the AA. 5-25% of the herbaceous part of the AA. 25-50% of the herbaceous part of the AA. 50-95% of the herbaceous part of the AA. >95% of the herbaceous part of the AA.	0 1 0 0 0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
F18	Sedge Cover	Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy: <5% of the vegetated area, or none. 5-50% of the vegetated area. 50-95% of the vegetated area. >95% of the vegetated area.	0 1 0 0	[CS]
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year. those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1 0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals). invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody). invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody). invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody). invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	1 0 0 0 0	[EC, PH, POL, Sens]
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species none of the upland edge (invasives apparently absent), or AA has no upland edge. some (but <5%) of the upland edge. 5-50% of the upland edge. most (>50%) of the upland edge.	1 0 0 0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains <u>surface</u> water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	1		AllSat2
	99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat1	
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	1		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
	Neither of above. There are 3 or more depth classes and none occupy >50%.	0			
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue. If false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed.	OpenW
F33	% of Ponded Water that is Open	in ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded1
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	1		
		70-99% of the ponded water.	0		
	100% of the ponded water.	0		AllOpenPond	
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	1		
		50 - 100 m	0		
	> 100 m, or open water is absent at that time.	0			
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	1		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is: <1% of the emergent vegetation, or emergent vegetation is absent. <b>SKIP to F38.</b> 1-25% of the emergent vegetation. 25-75% of the emergent vegetation. >75% of the emergent vegetation.	0 0 0 1	Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly: Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water. Intermediate. Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0 0 0 1	[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and <b>SKIP to F42</b> (Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided <b>NOT</b> by living vegetation, but by accumulations of <b>dead wood and undercut banks</b> is: Little or none. Intermediate. Extensive.	0 0 0	For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.] persistent (surface water flows out for >9 months/year). seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive). temporary (surface water flows out for <14 days, not necessarily consecutive). none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. <b>SKIP to F47</b> (pH) no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. <b>SKIP to F47</b> (pH Measurement).	1 0 0 0 0	Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/e/D/C/catalogue-E.asp">http://w.snb.ca/geonb1/e/D/C/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water: mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features. is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0 1 0	"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, <b>SKIP to F47</b> (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water]. Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. bumps into herbaceous vegetation but mostly remains in fairly straight channels. bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0 1 0 0	[FA, FR, INV, NR, OE, PR, SR, WS]	
F47	pH Measurement	The pH in most of the AA's surface water: was measured, and is: [enter the reading in the column to the right]: was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g. Labrador tea) are prevalent. Enter "1". neither of above. Enter "1".	0 1	Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information): TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]: Conductivity is [enter the reading in µS/cm in the column to the right]: was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1". neither of above	0 0 0 1	See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE): evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1 0 0	[FA, FR, PH, SBM, Sens, WBF, WBN]	
F50	Groundwater Strength of Evidence	Select first applicable choice. Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5. Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	0 0 1	Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
F51	Internal Gradient	The gradient along most of the flow path within the AA is: <2% or the AA has no surface water outlet (not even seasonally) 2-5% 6-10% >10%	1 0 0 0	This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSleep

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	1
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	1
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	1
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no).	0 Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	1
		unknown if new or expanded within 20 years or not.	0
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, Fav, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0 [PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0 [AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[Fav, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Suppinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0 [PH, PR]

BuffAINat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1	<p><b>Aberrant Timing of Water Inputs</b></p> <p><i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i></p> <p>stormwater from impervious surfaces that drains directly to the wetland</p> <p>water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation</p> <p>regular removal of surface or groundwater for irrigation or other consumptive use</p> <p>flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland</p> <p>a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)</p> <p>excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch</p> <p>artificial drains or ditches in or near the wetland</p> <p>accelerated dewatering or channelization of an adjacent or internal channel (incised below the historical water table level)</p> <p>logging within the wetland</p> <p>subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles</p> <p>straightening, ditching, dredging, and/or lining of tributary channels</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th style="width:20%;">Severe (3 points)</th> <th style="width:20%;">Medium (2 points)</th> <th style="width:20%;">Mild (1 point)</th> <th style="width:10%;"></th> </tr> </thead> <tbody> <tr> <td>Spatial extent of timing shift within the wetland</td> <td>&gt;95% of wetland</td> <td>5-95% of wetland</td> <td>&lt;5% of wetland</td> <td style="text-align: center;">0</td> </tr> <tr> <td>When most of the timing shift began</td> <td>&lt;3 yrs ago</td> <td>3-9 yrs ago</td> <td>10-100 yrs ago</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="5"><i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i></td> </tr> <tr> <td>Input timing now vs. previously</td> <td>shift of weeks</td> <td>shift of days</td> <td>shift of hours or minutes</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Flashiness or muting</td> <td>became very flashy or controlled</td> <td>intermediate</td> <td>became mildly flashy or controlled</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>0</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.00</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	0	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0	<b>Sum=</b>				<b>0</b>	<b>Final Score=</b>				<b>0.00</b>
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S2	<p><b>Accelerated Inputs of Contaminants and/or Salts</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities</p> <p>metals &amp; chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1</a>)</p> <p>road salt</p> <p>spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th style="width:20%;">Severe (3 points)</th> <th style="width:20%;">Medium (2 points)</th> <th style="width:20%;">Mild (1 point)</th> <th style="width:10%;"></th> </tr> </thead> <tbody> <tr> <td>Usual toxicity of most toxic contaminants</td> <td>industrial effluent, mining waste, unmanaged landfill</td> <td>cropland, managed farm, pipeline or transmission rights-of-way</td> <td>low density residential</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td>frequent and year-round</td> <td>frequent but mostly seasonal</td> <td>infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">3</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td>0 - 15 m</td> <td>15-100 m or in groundwater</td> <td>in more distant part of contributing area</td> <td style="text-align: center;">2</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>8</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.89</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission rights-of-way	low density residential	3	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	2	<b>Sum=</b>				<b>8</b>	<b>Final Score=</b>				<b>0.89</b>										
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S3	<p><b>Accelerated Inputs of Nutrients</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills</p> <p>fertilizers applied to lawns, ag lands, or other areas in the CA</p> <p>livestock, dogs</p> <p>artificial drainage of upslope lands</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th style="width:20%;">Severe (3 points)</th> <th style="width:20%;">Medium (2 points)</th> <th style="width:20%;">Mild (1 point)</th> <th style="width:10%;"></th> </tr> </thead> <tbody> <tr> <td>Type of loading</td> <td>high density of unmaintained septic, some types of industrial sources</td> <td>moderate density septic, cropland, secondary wastewater treatment plant</td> <td>livestock, pets, low density residential</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td>frequent and year-round</td> <td>frequent but mostly seasonal</td> <td>infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">1</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td>0 - 15 m</td> <td>15-100 m or in groundwater</td> <td>in more distant part of contributing area</td> <td style="text-align: center;">2</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>6</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.67</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	3	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	1	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	2	<b>Sum=</b>				<b>6</b>	<b>Final Score=</b>				<b>0.67</b>										
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S4	<b>Excessive Sediment Loading from Contributing Area</b>					
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>					
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires					
	erosion from construction, in-channel machinery in the CA					
	erosion from off-road vehicles in the CA					
	erosion from livestock or foot traffic in the CA					
	stormwater or wastewater effluent					
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction					
	accelerated channel downcutting or headcutting of tributaries due to altered land use					
	other human-related disturbances within the CA					
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA		extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration of sediment inputs to the wetland		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources		0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment						
				Sum=	0	
				Final Score=	0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>					
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>					
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods					
	leveling or other grading not to the natural contour					
	tillage, plowing (but excluding disking for enhancement of native plants)					
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland					
	excavation					
	ditch cleaning or dredging in or adjacent to the wetland					
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments					
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil		>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration		long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration		frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
				Sum=	0	
				Final Score=	0.00	

Wetland ID:	Wetland 5A,B
Date:	8/25/17
Observer:	C. LaFlamme, B. Leights
Latitude & Longitude (decimal degrees):	45.653944, -62.651459

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	1.26	Lower	0.00	Lower	2.51	0.12
Stream Flow Support (SFS)	3.54	Moderate	2.97	Moderate	1.89	2.19
Water Cooling (WC)	1.42	Lower	0.00	Lower	0.94	0.00
Sediment Retention & Stabilisation (SR)	3.03	Moderate	10.00	Higher	5.08	10.00
Phosphorus Retention (PR)	2.69	Moderate	10.00	Higher	5.48	10.00
Nitrate Removal & Retention (NR)	1.26	Lower	10.00	Higher	4.53	10.00
Carbon Sequestration (CS)	5.04	Moderate			6.66	
Organic Nutrient Export (OE)	5.54	Moderate			4.40	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	6.81	Higher	2.02	Moderate	4.30	1.43
Aquatic Invertebrate Habitat (INV)	9.90	Higher	7.31	Higher	7.37	5.20
Amphibian & Turtle Habitat (AM)	8.01	Higher	9.42	Higher	7.67	7.71
Waterbird Feeding Habitat (WBF)	6.43	Higher	10.00	Higher	5.15	10.00
Waterbird Nesting Habitat (WBN)	7.42	Higher	10.00	Higher	6.14	10.00
Songbird, Raptor, & Mammal Habitat (SBM)	9.63	Higher	10.00	Higher	7.97	10.00
Pollinator Habitat (POL)	8.16	Higher	10.00	Higher	6.76	10.00
Native Plant Habitat (PH)	4.93	Higher	9.50	Higher	5.49	8.24
Public Use & Recognition (PU)			1.81	Lower		1.62
Wetland Sensitivity (Sens)			2.38	Lower		2.94
Wetland Ecological Condition (EC)			7.24	Higher		8.33
Wetland Stressors (STR) (higher score means more stress)			3.93	Moderate		3.06
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	1.26	Lower	0.00	Lower	2.51	0.12
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	3.34	Moderate	10.00	Higher	6.05	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	7.31	Higher	5.18	Moderate	5.51	3.83
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	7.67	Higher	10.00	Higher	6.16	7.91
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	8.86	Higher	9.93	Higher	7.35	9.71
WETLAND CONDITION (EC)			7.24	Higher		8.33
WETLAND RISK (average of Sensitivity & Stressors)			2.05	Lower		3.00

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-6 Boat Harbour
Investigator Name:	Marina Dulmage, Amanda Facey, Brady Leights
Date of Field Assessment:	25/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.652383
Longitude (decimal degrees):	-62.655586
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	0.57
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	25-Aug-17	Site Identifier: WL-6	Investigator: MD, AF, BL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	<p>Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one.</p> <p>New Brunswick</p> <p>Nova Scotia</p> <p>Prince Edward Island</p> <p>Newfoundland-Labrador</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.</p>
OF2	Ponded Area Within 1 km.	<p>The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is:</p> <p>&lt;0.01 hectare (about 10 m x 10 m)</p> <p>0.01 - 0.1 hectare</p> <p>0.1 - 1 hectare</p> <p>1 to 10 hectares</p> <p>10 to 100 hectares</p> <p>&gt;100 hectares</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>"Adjacent" means not separated from the AA by a wide expanse (&gt;50 m) of upland (including roads &gt;50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw &amp; Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]</p>
OF3	Ponded Water & Wetland Within 1 km	<p>The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is:</p> <p>&lt;0.01 hectare (about 10 m x 10 m)</p> <p>0.01 - 0.1 hectare</p> <p>0.1 - 1 hectare</p> <p>1 to 10 hectares</p> <p>10 to 100 hectares</p> <p>&gt;100 hectares</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p>	<p>See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]</p>
OF4	Size of Largest Nearby Vegetated Tract or Corridor	<p>The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is:</p> <p>&lt;0.01 hectare (about 10 m x 10 m)</p> <p>0.01 - 0.1 hectare</p> <p>0.1 - 1 hectare</p> <p>1 to 10 hectares</p> <p>10 to 100 hectares</p> <p>100 to 1000 hectares</p> <p>&gt;1000 hectares [<i>This is nearly always the answer in relatively undeveloped landscapes.</i>]</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]</p>
OF5	Distance to Large Vegetated Tract	<p>The minimum distance from the <b>edge</b> of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is:</p> <p>&lt;50 m, and not separated completely from the 375-ha vegetated area by any width of <b>paved</b> road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains &gt;375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes].</p> <p>&lt;50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain &gt;375 ha of vegetation.</p> <p>50-500 m, and <b>not</b> separated.</p> <p>50-500 m, but separated by those features.</p> <p>0.5 - 5 km, and <b>not</b> separated.</p> <p>0.5 - 5 km, but separated by those features.</p> <p>none of the above (the closest patches or corridors which are that large are &gt;5 km away).</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>To measure distance, use Google Earth Pro (Ruler &gt; Line tool). Or use Draw &amp; Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]</p>
OF6	Herbaceous Uniqueness	<p>The AA's vegetation cover is &gt;10% herbaceous but uplands within 5 km have &lt;10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider:</p> <p>The AA's vegetation cover is &gt;10% herbaceous but uplands within 1 km have &lt;10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider:</p> <p>The AA's vegetation cover is &gt;10% herbaceous but uplands within 100 m of the wetland edge have &lt;10% herbaceous cover. If so, enter "1".</p> <p>[* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]</p>	<p>0</p>	<p>For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]</p>
OF7	Woody Uniqueness	<p>The AA's vegetation cover is &gt;10% woody but uplands within 5 km have &lt;10% woody cover. If so, enter "3" and continue to OF8. If not, consider:</p> <p>The AA's vegetation is &gt;10% woody but uplands within 1 km have &lt;10% woody cover. If so enter "2" and continue to OF8. If not, consider:</p> <p>The AA's vegetation is &gt;10% woody but uplands within 100 m of the wetland edge have &lt;10% woody cover. If so, enter "1"</p> <p>[*NOTE: woody cover = trees &amp; shrubs taller than 1 m]</p>	<p>0</p>	<p>See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]</p>
OF8	Local Vegetated Cover Percentage	<p>Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is:</p> <p>&lt;5% of the land.</p> <p>5 to 20% of the land.</p> <p>20 to 60% of the land.</p> <p>60 to 90% of the land.</p> <p>&gt;90% of the land. SKIP to OF10.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]</p>

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		Impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		Bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria. [FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
		>500 m	1	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Ponded Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	1	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Pondered Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	1	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.028	[NR, Sens, SFSv, WCV, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and limes with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1			

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	1	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	1	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry>WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
		>2 km, or wetland lacks an inlet and/or outlet.	1	
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]:</i>		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanaticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanaticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian</b> or <b>reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird</b> or <b>raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 25, 2017		Site Identifier: WL-6		Investigator: MD, AF, BL	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	Fen_ Marsh
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~203 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>2</p> <p>4</p> <p>2</p> <p>3</p> <p>2</p> <p>2</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-diameter trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They <u>each</u> comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>1</p> <p>0</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/ hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
F9	N Fixers	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		
		<1% or none	1	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	Exclude moss growing on trees and rocks. [CS, PH]
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		The cover of <b>Sphagnum</b> moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	25-50% of the vegetated part of the AA.	0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		50-95% of the vegetated part of the AA.	1	
		>95% of the vegetated part of the AA.	0	
		Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
F12	Ground Irregularity	Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
		Intermediate.	1	
F13	Upland Inclusions	Several (extensive micro-topography).	0	[AM, NR, SBM]
		Within the AA, inclusions of upland are:		
		Few or none.	1	
F14	Soil Texture	Intermediate (1 - 10% of vegetated part of the AA).	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and Peat, to 40 cm depth or greater.	1	
F15	Shorebird Feeding Habitats	Peat or organic <40 cm deep.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	1000 - 10,000 sq. m.	0	[AM, WBF, WBN]
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
F17	Forb Cover	25-50% of the vegetated part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		50-95% of the vegetated part of the AA.	1	
		>95% of the vegetated part of the AA.	0	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
F18	Sedge Cover	5-25% of the herbaceous part of the AA.	0	[CS]
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	1	
		>95% of the herbaceous part of the AA.	0	
F19	Dominance of Most Abundant Herbaceous Species	Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		<5% of the vegetated area, or none.	0	
F20	Invasive Plant Cover	5-50% of the vegetated area.	1	[EC, PH, POL, Sens]
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
F21	Invasive Cover Along Upland Edge	those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
F22	Fringe Wetland	invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	[WBF, WBN, WCV, ]
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
F23	Lacustrine Wetland	most (>50%) of the upland edge.	0	[FR, PR, PU, WBF, WBN]
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
		some (but <5%) of the upland edge.	0	
F23	Lacustrine Wetland	5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
		During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	1		AllSat2
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP TO F27.	1		NoPersis
		1-20% of the AA.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	1		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	
		None, or <0.01 hectare and <1% of the AA. SKIP TO F29.	0		NoSeasonal
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded.	
		<10 cm deep (but >0).	1		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP TO F34.	0		NoPonded
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		OpenW
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP TO F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP TO F41 (Floating Algae & Duckweed).	0		NoOpenPonded
		1-4% of the ponded water. Enter "1" and SKIP TO F40 (Floating Algae & Duckweed).	0		NoOpenPonded1
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in</u> the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		
F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP TO F38.	0		NoRobustEm
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	0		

F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0	
		Intermediate.	0	
F38	Persistent Deepwater Area	Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0	
		If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0	
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]
		Little or none.	0	
		Intermediate.	0	
F40	Isolated Island	Extensive.	0	
		The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]
		persistent (surface water flows out for >9 months/year).	0	
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0	
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0	
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement)	0	
F43	Outflow Confinement	no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	1	
		During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0	
F44	Tributary Channel	leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0	
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0	
F45	Input Water Temperature	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]
F46	Throughflow Resistance	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]
F47	pH Measurement	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0	
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0	
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0	
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0	
F48	TDS and/or Conductivity	bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0	
		The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]
F49	Beaver Probability	was measured, and is: [enter the reading in the column to the right]:		
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0	
		neither of above. Enter "1".	1	
		neither of above	1	
F50	Groundwater Strength of Evidence	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0	
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0	
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1	
		Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS.]
F51	Internal Gradient	Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0	
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0	
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1	
		The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]
F51	Internal Gradient	<2% or the AA has no surface water outlet (not even seasonally)	1	
		2-5%	0	
		6-10%	0	
		>10%	0	

DeepPersist

OutNone1  
Outnone

Inflows

TooSteep

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	1
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	1
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	1
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	0
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	[PH, PR]

BuffAllNat

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

				Data																																						
S1	<p><b>Aberrant Timing of Water Inputs</b></p> <p><i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i></p> <p>stormwater from impervious surfaces that drains directly to the wetland</p> <p>water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation</p> <p>regular removal of surface or groundwater for irrigation or other consumptive use</p> <p>flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland</p> <p>a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)</p> <p>excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch</p> <p>artificial drains or ditches in or near the wetland</p> <p>accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)</p> <p>logging within the wetland</p> <p>subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles</p> <p>straightening, ditching, dredging, and/or lining of tributary channels</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Spatial extent of timing shift within the wetland</td> <td style="text-align: center;">&gt;95% of wetland</td> <td style="text-align: center;">5-95% of wetland</td> <td style="text-align: center;">&lt;5% of wetland</td> <td style="text-align: center;">1</td> </tr> <tr> <td>When most of the timing shift began</td> <td style="text-align: center;">&lt;3 yrs ago</td> <td style="text-align: center;">3-9 yrs ago</td> <td style="text-align: center;">10-100 yrs ago</td> <td style="text-align: center;">1</td> </tr> <tr> <td colspan="5"><i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i></td> </tr> <tr> <td>Input timing now vs. previously</td> <td style="text-align: center;">shift of weeks</td> <td style="text-align: center;">shift of days</td> <td style="text-align: center;">shift of hours or minutes</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Flashiness or muting</td> <td style="text-align: center;">became very flashy or controlled</td> <td style="text-align: center;">intermediate</td> <td style="text-align: center;">became mildly flashy or controlled</td> <td style="text-align: center;">1</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>5</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.42</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	1	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	1	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	2	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	1	<b>Sum=</b>				<b>5</b>	<b>Final Score=</b>				<b>0.42</b>	
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S2	<p><b>Accelerated Inputs of Contaminants and/or Salts</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities</p> <p>metals &amp; chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;n=B85A1846-1</a>)</p> <p>road salt</p> <p>spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Usual toxicity of most toxic contaminants</td> <td style="text-align: center;">industrial effluent, mining waste, unmanaged landfill</td> <td style="text-align: center;">cropland, managed farm, pipeline or transmission rights-of-way</td> <td style="text-align: center;">low density residential</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td style="text-align: center;">frequent and year-round</td> <td style="text-align: center;">frequent but mostly seasonal</td> <td style="text-align: center;">infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">0</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td style="text-align: center;">0 - 15 m</td> <td style="text-align: center;">15-100 m or in groundwater</td> <td style="text-align: center;">in more distant part of contributing area</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>0</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.00</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission rights-of-way	low density residential	0	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0	<b>Sum=</b>				<b>0</b>	<b>Final Score=</b>				<b>0.00</b>											
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S3	<p><b>Accelerated Inputs of Nutrients</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRv, PRv, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills</p> <p>fertilizers applied to lawns, ag lands, or other areas in the CA</p> <p>livestock, dogs</p> <p>artificial drainage of upslope lands</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Type of loading</td> <td style="text-align: center;">high density of unmaintained septic, some types of industrial sources</td> <td style="text-align: center;">moderate density septic, cropland, secondary wastewater treatment plant</td> <td style="text-align: center;">livestock, pets, low density residential</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td style="text-align: center;">frequent and year-round</td> <td style="text-align: center;">frequent but mostly seasonal</td> <td style="text-align: center;">infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">1</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td style="text-align: center;">0 - 15 m</td> <td style="text-align: center;">15-100 m or in groundwater</td> <td style="text-align: center;">in more distant part of contributing area</td> <td style="text-align: center;">2</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>5</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.56</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	1	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	2	<b>Sum=</b>				<b>5</b>	<b>Final Score=</b>				<b>0.56</b>											
	Severe (3 points)	Medium (2 points)	Mild (1 point)																																							
Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2																																						
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<b>Sum=</b>				<b>5</b>																																						
<b>Final Score=</b>				<b>0.56</b>																																						

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRV, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	1
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	1
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	1
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	2
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
0.42				
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
0.00				

Wetland ID:	WL-6
Date:	8/25/17
Observer:	MD, AF, BL
Latitude & Longitude (decimal degrees):	45.652383, -62.655586

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	7.21	Higher	1.21	Lower	7.25	1.95
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	0.00	Lower	0.00	Lower	0.00	0.00
Sediment Retention & Stabilisation (SR)	10.00	Higher	10.00	Higher	10.00	10.00
Phosphorus Retention (PR)	10.00	Higher	10.00	Higher	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	Higher	10.00	Higher	10.00	10.00
Carbon Sequestration (CS)	5.43	Moderate			6.84	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	2.59	Lower	3.86	Moderate	4.26	3.41
Amphibian & Turtle Habitat (AM)	4.77	Moderate	3.55	Moderate	6.01	3.73
Waterbird Feeding Habitat (WBF)	5.85	Moderate	0.83	Moderate	4.69	0.83
Waterbird Nesting Habitat (WBN)	3.93	Moderate	0.00	Lower	3.25	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	7.87	Higher	0.00	Lower	6.51	0.00
Pollinator Habitat (POL)	8.36	Higher	0.00	Lower	6.92	0.00
Native Plant Habitat (PH)	3.71	Moderate	5.16	Moderate	4.98	4.48
Public Use & Recognition (PU)			1.81	Lower		1.62
Wetland Sensitivity (Sens)			4.93	Moderate		3.75
Wetland Ecological Condition (EC)			4.94	Moderate		6.94
Wetland Stressors (STR) (higher score means more stress)			5.41	Higher		3.69
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	7.21	Higher	1.21	Lower	7.25	1.95
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	10.00	Higher	9.60	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	0.62	Lower	2.39	Lower	2.66	2.27
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	4.15	Moderate	3.08	Moderate	4.40	2.32
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	7.22	Higher	3.05	Lower	6.53	2.99
WETLAND CONDITION (EC)			4.94	Moderate		6.94
WETLAND RISK (average of Sensitivity & Stressors)			5.50	Moderate		3.72

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 7, Boat Harbour
Investigator Name:	Christina LaFlamme, Brady Leights
Date of Field Assessment:	06/09/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.656997
Longitude (decimal degrees):	-62.659381
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~3.78
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	06-Sep-17	Site Identifier: WL-7	Investigator: C. LaFlamme, B. Leights	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 1 0 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 1 0 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [ <i>This is nearly always the answer in relatively undeveloped landscapes.</i> ]	0 0 0 1 0 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and not separated. 50-500 m, but separated by those features. 0.5 - 5 km, and not separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. <b>SKIP to OF10.</b>	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the <b>5-km</b> radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured <b>along</b> the maintained road nearest the AA, the distance to the nearest <b>population center</b> is:		"Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool- Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAV, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the <b>center</b> of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
>500 m	1			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is <b>larger than 8 hectares</b> is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	1	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest <b>tidal water body</b> (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do <b>not</b> show Flood Zone or Flood Risk areas (or <b>no such mapping has been done locally</b> ) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is <b>no infrastructure</b> vulnerable to river flooding unrelated to tidal storm surges.	1			
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.022	[NR, Sens, SFSv, WCV, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of <b>metals, hydrocarbons, nutrients</b> , or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow <b>into</b> the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and limes with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope from</b> the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	1	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry>WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1 - 2 km	0	
		>2 km, or wetland lacks an inlet and/or outlet.	1	
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have other fish at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the amphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the waterbird species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the nesting songbird or raptor species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file, during their nesting season (May-July for most species).	0	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAS_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: Sept 6, 2017		Site Identifier: WL-7		Investigator: C. LaFlamme, B. Leights	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/ hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is: Few or none that meet these criteria.	1	Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: <1% or none	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: <5% of the vegetated part of the AA.	0	Exclude moss growing on trees and rocks. [CS, PH]
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is: Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is: Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Intermediate.	1	
		Several (extensive micro-topography).	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are: Few or none.	1	[AM, NR, SBM]
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)] Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA]. none, or <100 sq. m.	1	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is: <5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	[AM, WBF, WBN]
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	1	
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of: <5% of the herbaceous part of the AA.	1	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	0	
		>95% of the herbaceous part of the AA.	0	
F18	Sedge Cover	Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy: <5% of the vegetated area, or none.	1	[CS]
		5-50% of the vegetated area.	0	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. Invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	[EC, PH, POL, Sens]
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		some (but <5%) of the upland edge.	0	
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	AllSat2 AllSat1
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis  AllWet
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
		>95% of the AA. True for many fringe wetlands.	0		
F26	% of Summer-time Water that is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	1		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	1		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	1		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1  AllOpenPond
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	1		
		100% of the ponded water.	0		
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	1		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	1		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
F38	Persistent Deepwater Area	Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	1		DeepPersist
		If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	1		
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
		Extensive.	1		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/en/DC/catalogue-E.asp">http://w.snb.ca/geonb1/en/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH measurement)	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRV, PH, PRV, SRV]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRV, PH, PRV, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
F50	Groundwater Strength of Evidence	unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
		Select first applicable choice:		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRV, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
F51	Internal Gradient	Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		TooSteep
		The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
>10%	0				

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	1
		60 to 90%	0
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	0
		5-30%	1
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no).	0 Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	1
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	0
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	0
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0 [PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0 [AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SupplInfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0 [PH, PR]

BuffAllNat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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<b>S1</b>	<b>Aberrant Timing of Water Inputs</b>				
<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>					
stormwater from impervious surfaces that drains directly to the wetland					
water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation					
regular removal of surface or groundwater for irrigation or other consumptive use					
flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland					
a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)					
excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch					
artificial drains or ditches in or near the wetland					
accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)					
logging within the wetland					
subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles					
straightening, ditching, dredging, and/or lining of tributary channels					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of timing shift within the wetland		>95% of wetland	5-95% of wetland	<5% of wetland	2
When most of the timing shift began		<3 yrs ago	3-9 yrs ago	10-100 yrs ago	1
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					
Input timing now vs. previously		shift of weeks	shift of days	shift of hours or minutes	2
Flashiness or muting		became very flashy or controlled	intermediate	became mildly flashy or controlled	1
<b>Sum=</b>					<b>6</b>
<b>Final Score=</b>					<b>0.50</b>

<b>S2</b>	<b>Accelerated Inputs of Contaminants and/or Salts</b>				
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities					
metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/ gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/nrnp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/nrnp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )					
road salt					
spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Usual toxicity of most toxic contaminants		industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission rights-of-way	low density residential	2
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	2
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3
<b>Sum=</b>					<b>7</b>
<b>Final Score=</b>					<b>0.78</b>

<b>S3</b>	<b>Accelerated Inputs of Nutrients</b>				
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRv, PRv, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills					
fertilizers applied to lawns, ag lands, or other areas in the CA					
livestock, dogs					
artificial drainage of upslope lands					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Type of loading		high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	2
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3
<b>Sum=</b>					<b>7</b>
<b>Final Score=</b>					<b>0.78</b>

S4	<b>Excessive Sediment Loading from Contributing Area</b>				
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
	erosion from construction, in-channel machinery in the CA				
	erosion from off-road vehicles in the CA				
	erosion from livestock or foot traffic in the CA				
	stormwater or wastewater effluent				
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
	accelerated channel downcutting or headcutting of tributaries due to altered land use				
	other human-related disturbances within the CA				
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
	Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment			Sum=	0	
			Final Score=	0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>				
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
	leveling or other grading not to the natural contour				
	tillage, plowing (but excluding disking for enhancement of native plants)				
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
	excavation				
	ditch cleaning or dredging in or adjacent to the wetland				
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
	Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
			Sum=	0	
			Final Score=	0.00	

Wetland ID:	WL-7
Date:	9/6/17
Observer:	C. LaFlamme, B. Leights
Latitude & Longitude (decimal degrees):	45.656997, -62.659381

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

<i>Results for this Assessment Area (AA):</i>						
<b>Wetland Functions or Other Attributes:</b>	<b>Function Score (Normalised)</b>	<b>Function Rating</b>	<b>Benefits Score (Normalised)</b>	<b>Benefits Rating</b>	<b>Function Score (raw)</b>	<b>Benefits Score (raw)</b>
Water Storage & Delay (WS)	7.10	Higher	0.00	Lower	7.17	0.06
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	1.83	Lower	0.00	Lower	1.22	0.00
Sediment Retention & Stabilisation (SR)	10.00	Higher	10.00	Higher	10.00	10.00
Phosphorus Retention (PR)	10.00	Higher	10.00	Higher	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	Higher	6.67	Higher	10.00	7.78
Carbon Sequestration (CS)	5.55	Moderate			6.89	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	6.57	Moderate	5.34	Moderate	5.96	4.18
Amphibian & Turtle Habitat (AM)	9.57	Higher	4.55	Moderate	8.47	4.41
Waterbird Feeding Habitat (WBF)	7.71	Higher	4.17	Moderate	6.18	4.17
Waterbird Nesting Habitat (WBN)	7.11	Higher	2.50	Moderate	5.88	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	5.51	Moderate	2.50	Moderate	4.56	2.50
Pollinator Habitat (POL)	7.76	Higher	0.00	Lower	6.43	0.00
Native Plant Habitat (PH)	1.26	Lower	4.22	Moderate	3.97	3.66
Public Use & Recognition (PU)			0.77	Lower		0.88
Wetland Sensitivity (Sens)			5.64	Moderate		3.98
Wetland Ecological Condition (EC)			4.94	Moderate		6.94
Wetland Stressors (STR) (higher score means more stress)			7.32	Higher		4.51
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	7.10	Higher	0.00	Lower	7.17	0.06
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	10.00	Higher	9.61	9.63
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	3.47	Lower	3.31	Moderate	3.88	2.79
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	7.93	Higher	5.03	Moderate	6.29	3.31
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	5.58	Moderate	2.92	Lower	5.71	2.86
WETLAND CONDITION (EC)			4.94	Moderate		6.94
WETLAND RISK (average of Sensitivity & Stressors)			7.97	Higher		4.24

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-8 Boat Harbour
Investigator Name:	Marina Dulmage, Amanda Facey
Date of Field Assessment:	23/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.651009
Longitude (decimal degrees):	-62.661279
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~4.2
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	23-Aug-17	Site Identifier: WL-8	Investigatc MLD, ANF	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 0 1 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	1 0 0 0 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [ <i>This is nearly always the answer in relatively undeveloped landscapes.</i> ]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and not separated. 50-500 m, but separated by those features. 0.5 - 5 km, and not separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured <b>along</b> the maintained road nearest the AA, the distance to the nearest <b>population center</b> is:		"Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool- Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	1	
		1 - 5 km	0	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the <b>center</b> of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	1	
>500 m	0			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	1	
		0.5 - 1 km, and not separated	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is <b>larger than 8 hectares</b> is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	1	
		1 -2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest <b>tidal water</b> body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do <b>not</b> show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is <b>no infrastructure</b> vulnerable to river flooding unrelated to tidal storm surges.	0			
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.0485	[NR, Sens, SFSv, WCv, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of <b>metals, hydrocarbons, nutrients,</b> or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow <b>into</b> the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1			

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	1	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	1	
		Mostly untrue	0	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry>WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	1	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEL_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: [mark just the first choice that is true]:		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably is not accessed by any anadromous fish species but is known or likely to have other fish at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented [mark all applicable]:		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the amphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the waterbird species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the songbird or raptor species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: Aug 23, 2017		Site Identifier: WL-8		Investigator: MLD, ANF	
<p><b>Form F (Field).</b> Non-tidal Wetland Data Form. WESP-AC version 1.2.1.1. DIRECTIONS: Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	0 0 1 0	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	Fen_    Marsh
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1 A2 B1 B2</p>	0 0 0 0	1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m. 4</p> <p>deciduous trees taller than 3 m. 4</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees. 1</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees. 1</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation. 1</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. 1</p>	4 4 1 1 1 1	Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry ( <i>Morella</i> ), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is <25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover. 0</p> <p>those species together do not comprise &gt; 50% of such cover. 1</p>	0 1	[PH, POL, SBM, Sens]	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall. 0</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall. 0</p> <p>coniferous, 10-19 cm diameter. 1</p> <p>broad-leaved deciduous 10-19 cm diameter. 1</p> <p>coniferous, 20-40 cm diameter. 1</p> <p>broad-leaved deciduous 20-40 cm diameter. 1</p> <p>coniferous, &gt;40 cm diameter. 1</p> <p>broad-leaved deciduous &gt;40 cm diameter. 1</p>	0 0 1 1 1 1 1	Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA. 0</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. 0</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one. 1</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. 0</p>	0 0 1 0	[AM, INV, NR, PH, SBM, Sens]	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/ hectare which exceed this diameter. 1</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km. 0</p> <p>Several (&gt;8/hectare) but above not true. 0</p>	1 0 0	Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	1	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	1	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5% bare ground) is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
		Intermediate.	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are:		[AM, NR, SBM]
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)		[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and	1	
		Peat, to 40 cm depth or greater.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		[AM, WBF, WBN]
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	1	
		50-95% of the vegetated part of the AA.	0	
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	1	
		50-95% of the herbaceous part of the AA.	0	
F18	Sedge Cover	Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		[CS]
		<5% of the vegetated area, or none.	1	
		5-50% of the vegetated area.	0	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		[EC, PH, POL, Sens]
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
		some (but <5%) of the upland edge.	0	
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA. 99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	1		AllSat2 AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:	0	If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summerlime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	1		
F27	% of AA that Is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	1		
		50-95% of the AA.	0		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boal is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	1		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	1		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	0		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue. If false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded NoOpenPonded1
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	AllOpenPond
		<1 m	0		
		1 - 9 m	1		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	1		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		
F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	1		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	0		

F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly: Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water. Intermediate. Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	1 0 0	[AM, FA, FR, INV, NR, OE, PH, PR, SR, SBM, SR, WBF, WBN]	
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is: Little or none. Intermediate. Extensive.	0 0 0	For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.] persistent (surface water flows out for >9 months/year). seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive). temporary (surface water flows out for <14 days, not necessarily consecutive). none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement). no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0 1 0 0	Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water: mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features. is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0 1 0	"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upstope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRV, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water]. Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. bumps into herbaceous vegetation but mostly remains in fairly straight channels. bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0 0 1 0	[FA, FR, INV, NR, OE, PR, SR, WS]	
F47	pH Measurement	The pH in most of the AA's surface water: was measured, and is: [enter the reading in the column to the right]: was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1". neither of above. Enter "1".	0 1 0	Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information): TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]: Conductivity is: [enter the reading in µS/cm in the column to the right]: was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1". neither of above	0 1 0	See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE): evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0 0 1	[FA, FR, PH, SBM, Sens, WBF, WBN]	
F50	Groundwater Strength of Evidence	Select first applicable choice. Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5. Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	0 0 1	Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
F51	Internal Gradient	The gradient along most of the flow path within the AA is: <2% or the AA has no surface water outlet (not even seasonally) 2-5% 6-10% >10%	1 0 0 0	This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSleep
<p><b>Note for the next three questions:</b> If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.</p>					
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is: <5% 5 to 30% 30 to 60% 60 to 90% >90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0 1 0 0 0	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]	BuffAIInat
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): impervious surface, e.g., paved road, parking lot, building, exposed rock. bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0 0	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]	

F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0	
		2-5%	1	
		5-30%	0	
		>30%	0	
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	1	
		yes, and created or expanded 20 - 100 years ago.	0	
		yes, and created or expanded 3-20 years ago.	0	
		yes, and created or expanded within last 3 years.	0	
		yes, but time of origin or expansion unknown.	0	
unknown if new or expanded within 20 years or not.	0			
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0	
		burned 6-10 years ago.	0	
		burned 11-30 years ago.	0	
		burned >30 years ago, or no evidence of a burn and no data.	1	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]
		<25%	1	
		25-50%	0	
		>50%	0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1	
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0	
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]		[AM, Fav, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0	
		<5% and inhabited building is within 100 m of the AA.	0	
		5-50% and no inhabited building is within 100 m of the AA.	0	
		5-50% and inhabited building is within 100 m of the AA.	0	
		50-95%, with or without inhabited building nearby.	0	
		>95% of the AA with or without inhabited building nearby.	1	
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above].		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1	
		5-50%	0	
		50-95%	0	
		>95% of the AA.	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[Fav, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
none of the above.	0			
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Suppinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0	[PH, PR]

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

				Data	
S1	<b>Aberrant Timing of Water Inputs</b>				
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>				
	stormwater from impervious surfaces that drains directly to the wetland				
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation				
	regular removal of surface or groundwater for irrigation or other consumptive use				
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland				
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)				
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch				
	artificial drains or ditches in or near the wetland				
	accelerated dewatering or channelization of an adjacent or internal channel (incised below the historical water table level)				
	logging within the wetland				
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles				
	straightening, ditching, dredging, and/or lining of tributary channels				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
			Severe (3 points)	Medium (2 points)	Mild (1 point)
	Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	0
	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>				
Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0	
Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0	
			Sum=	0	
			Final Score=	0.00	
S2	<b>Accelerated Inputs of Contaminants and/or Salts</b>				
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities				1
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )				
	road salt				
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
			Severe (3 points)	Medium (2 points)	Mild (1 point)
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission rights-of-way	low density residential	3
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	1
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	1	
			Sum=	5	
			Final Score=	0.56	
S3	<b>Accelerated Inputs of Nutrients</b>				
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills				
	fertilizers applied to lawns, ag lands, or other areas in the CA				
	livestock, dogs				
	artificial drainage of upslope lands				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
			Severe (3 points)	Medium (2 points)	Mild (1 point)
Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	0	
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0	
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0	
			Sum=	0	
			Final Score=	0.00	

S4	<b>Excessive Sediment Loading from Contributing Area</b>					
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>					
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires					
	erosion from construction, in-channel machinery in the CA					
	erosion from off-road vehicles in the CA					
	erosion from livestock or foot traffic in the CA					
	stormwater or wastewater effluent					
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction					
	accelerated channel downcutting or headcutting of tributaries due to altered land use					
	other human-related disturbances within the CA					
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA		extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration of sediment inputs to the wetland		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources		0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment						
				Sum=	0	
				Final Score=	0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>					
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>					
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods					
	leveling or other grading not to the natural contour					
	tillage, plowing (but excluding disking for enhancement of native plants)					
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland					
	excavation					
	ditch cleaning or dredging in or adjacent to the wetland					
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments					
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil		>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration		long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration		frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
				Sum=	0	
				Final Score=	0.00	

Wetland ID:	WL-8
Date:	8/23/17
Observer:	Marina Dulmage, Amanda Facey
Latitude & Longitude (decimal degrees):	45.651009, -62.661279

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	2.31	Lower	0.59	Lower	3.35	1.37
Stream Flow Support (SFS)	2.29	Lower	1.75	Moderate	1.22	1.30
Water Cooling (WC)	6.00	Higher	1.15	Lower	4.00	0.74
Sediment Retention & Stabilisation (SR)	2.25	Moderate	10.00	Higher	4.53	10.00
Phosphorus Retention (PR)	2.34	Moderate	10.00	Higher	5.27	10.00
Nitrate Removal & Retention (NR)	2.65	Lower	10.00	Higher	4.96	10.00
Carbon Sequestration (CS)	6.19	Higher			7.18	
Organic Nutrient Export (OE)	6.37	Higher			5.05	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	7.42	Higher	4.43	Moderate	6.32	3.71
Amphibian & Turtle Habitat (AM)	4.63	Moderate	5.53	Moderate	5.94	5.08
Waterbird Feeding Habitat (WBF)	6.61	Higher	2.50	Moderate	5.30	2.50
Waterbird Nesting Habitat (WBN)	4.31	Moderate	2.50	Moderate	3.56	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	8.97	Higher	2.50	Moderate	7.42	2.50
Pollinator Habitat (POL)	8.52	Higher	0.00	Lower	7.06	0.00
Native Plant Habitat (PH)	5.36	Higher	5.57	Moderate	5.67	4.83
Public Use & Recognition (PU)			2.03	Lower		1.78
Wetland Sensitivity (Sens)			7.27	Higher		4.51
Wetland Ecological Condition (EC)			9.08	Higher		9.44
Wetland Stressors (STR) (higher score means more stress)			6.25	Higher		4.05
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	2.31	Lower	0.59	Lower	3.35	1.37
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	4.07	Moderate	10.00	Higher	6.33	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	6.65	Higher	3.35	Moderate	5.23	2.81
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	4.26	Moderate	5.49	Moderate	4.45	3.55
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	8.30	Higher	3.72	Lower	7.07	3.64
WETLAND CONDITION (EC)			9.08	Higher		9.44
WETLAND RISK (average of Sensitivity & Stressors)			8.13	Higher		4.28

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-9, Boat Harbour
Investigator Name:	Marina Dulmage, Deborah Bear
Date of Field Assessment:	23/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.652755
Longitude (decimal degrees):	-62.664731
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	2.28
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	23-Aug-17	Site Identifier: WL-9	Investigator: MLD, DAB	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 1 0 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	1 0 0 0 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all adjacent upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	1 0 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]

OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is:		In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]
		<5% of the land.	0	
		5 to 20% of the land.	0	
		20 to 60% of the land.	0	
		60 to 90% of the land.	1	
		>90% of the land. SKIP to OF10.	0	
OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	1	
		0.5 - 1 km	0	
		1 - 5 km	0	
		>5 km	0	
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	1	
		>500 m	0	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
		none of the above (the closest patches or corridors that large are >1 km away).	0	
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	1	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
		>40 km	0	
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1	
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.034	[NR, Sens, SFSv, WCv, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]

OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of <b>metals, hydrocarbons, nutrients</b> , or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow <b>into</b> the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	
OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following:		[NRv, PRv, SRv, WSV]
		(a) input channel is present,		
		(b) input channels have been straightened,		
		(c) upslope wetlands have been ditched extensively,		
		(d) land cover is mostly non-forest,		
		(e) CA slopes are steep, and/or		
		(f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients.		
		This statement is:		
		Mostly true	0	
		Somewhat true	1	
		Mostly untrue	0	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	1	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	1	
		100 - 1000 m	0	
		1 - 2 km	0	
		>2 km, or wetland lacks an inlet and/or outlet.	0	
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		<a href="http://atlantic.salmonofederation.org/eng/Introduction.html">http://atlantic.salmonofederation.org/eng/Introduction.html</a> has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably is not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file, during their nesting season (May-July for most species).	0	
		none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]

OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNV]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]
OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 23, 2017		Site Identifier: WL-9		Investigator: MLD, DAB	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	Fen_ Marsh
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>3</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	

F7	Large Snags (Dead Standing Trees)	The number of large snags (diameter >20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:		Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]
		None, or fewer than 8/ hectare which exceed this diameter.	1	
		Several (>8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.	0	
		Several (>8/hectare) but above not true.	0	
F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	
		Intermediate.	0	
		Several (extensive micro-topography).	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are:		[AM, NR, SBM]
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: (include also any area that is adjacent to the AA).		This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		[AM, WBF, WBN]
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	1	
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	0	
F18	Sedge Cover	Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy:		[CS]
		<5% of the vegetated area, or none.	1	
		5-50% of the vegetated area.	0	
		50-95% of the vegetated area.	0	
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying SupplInfo file.		[EC, PH, POL, Sens]
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	

NoHerbCov

AllForbCov

F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
		some (but <5%) of the upland edge.	0	
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]
F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SR, WBF, WBN, WC]
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0	
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0	
		25-50% of the AA never contains surface water.	1	
		50-75% of the AA never contains surface water.	0	
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0	
99-100% AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0			
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0	
		1-20% of the AA.	0	
		20-50% of the AA.	0	
		50-95% of the AA.	1	
>95% of the AA. True for many fringe wetlands.	0			
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features <u>that are within</u> the AA at that time is:		[FA, WC]
		<5% of the water is shaded, or no surface water is present then.	0	
		5-25% of the water is shaded.	1	
		25-50% of the water is shaded.	0	
		50-75% of the water is shaded.	0	
		>75% of the water is shaded.	0	
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0	
		1-20% of the AA, or <1% but >0.01 ha.	1	
		20-50% of the AA.	0	
		50-95% of the AA.	0	
>95% of the AA.	0			
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]
		<10 cm change (stable or nearly so).	0	
		10 cm - 50 cm change.	1	
		0.5 - 1 m change.	0	
		1-2 m change.	0	
>2 m change.	0			
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0	TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]
		<10 cm deep (but >0).	0	
		10 - 50 cm deep.	1	
		0.5 - 1 m deep.	0	
		1 - 2 m deep.	0	
>2 m deep. True for many fringe wetlands.	0			
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0	
		One depth class that comprises 50-90% of the AA's inundated area.	1	
Neither of above. There are 3 or more depth classes and none occupy >50%.	0			
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0	
		5-30% of the water.	0	
		30-70% of the water.	0	
		70-95% of the water.	1	
>95% of the water.	0			
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0	
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0	
		5-30% of the ponded water.	0	
		30-70% of the ponded water.	0	
		70-99% of the ponded water.	0	
100% of the ponded water.	0			
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]
		<1 m	0	
		1 - 9 m	0	
		10 - 29 m	0	
		30 - 49 m	0	
		50 - 100 m	0	
		> 100 m, or open water is absent at that time.	0	

F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		
F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geonbt1/e/DC/catalogue-E.asp">http://w.snb.ca/geonbt1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	1		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH measurement)	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	1		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, Prv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	1		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-colored. Or if no surface water, then mosses and plants that indicate peatland (e.g. Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, Prv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row].			
		Conductivity is [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, Prv, SFS, WC, WS.]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep
		<2% or the AA has no surface water outlet (not even seasonally)	0		
		2-5%	1		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.				
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	1	
		5 to 30%	0	
		30 to 60%	0	
		60 to 90%	0	
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0	
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):		[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0	
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0	
		2-5%	1	
		5-30%	0	
		>30%	0	
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no).	0	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0	
		yes, and created or expanded 20 - 100 years ago.	0	
		yes, and created or expanded 3-20 years ago.	0	
		yes, and created or expanded within last 3 years.	0	
		yes, but time of origin or expansion unknown.	0	
		unknown if new or expanded within 20 years or not.	1	
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0	
		burned 6-10 years ago.	0	
		burned 11-30 years ago.	0	
		burned >30 years ago, or no evidence of a burn and no data.	1	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]
		<25%	1	
		25-50%	0	
		>50%	0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1	
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0	
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]		[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0	
		<5% and inhabited building is within 100 m of the AA.	0	
		5-50% and no inhabited building is within 100 m of the AA.	0	
		5-50% and inhabited building is within 100 m of the AA.	0	
		50-95%, with or without inhabited building nearby.	1	
		>95% of the AA with or without inhabited building nearby.	0	
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above].		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1	
		5-50%	0	
		50-95%	0	
		>95% of the AA.	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
		none of the above.	1	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Suppinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0	[PH, PR]

BuffAINat

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

				Data		
S1	<b>Aberrant Timing of Water Inputs</b>					
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>					
	stormwater from impervious surfaces that drains directly to the wetland					
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation					
	regular removal of surface or groundwater for irrigation or other consumptive use					
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland					
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)					
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch					
	artificial drains or ditches in or near the wetland					
	accelerated dewatering or channelization of an adjacent or internal channel (incised below the historical water table level)					
	logging within the wetland					
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles					
	straightening, ditching, dredging, and/or lining of tributary channels					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland		0	
When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago		0	
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>						
Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes		0	
Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled		0	
			Sum=	0		
			Final Score=	0.00		
S2	<b>Accelerated Inputs of Contaminants and/or Salts</b>					
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>					
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities				1	
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )					
	road salt					
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission rights-of-way	low density residential		3
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly		1
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area		1	
			Sum=	5		
			Final Score=	0.56		
S3	<b>Accelerated Inputs of Nutrients</b>					
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>					
	stormwater or wastewater effluent (including failing septic systems), landfills				1	
	fertilizers applied to lawns, ag lands, or other areas in the CA					
	livestock, dogs					
	artificial drainage of upslope lands					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential		2
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly		1
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area		1	
			Sum=	4		
			Final Score=	0.44		

S4	<b>Excessive Sediment Loading from Contributing Area</b>					
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>					
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires					
	erosion from construction, in-channel machinery in the CA					
	erosion from off-road vehicles in the CA					
	erosion from livestock or foot traffic in the CA					
	stormwater or wastewater effluent					
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction					
	accelerated channel downcutting or headcutting of tributaries due to altered land use					
	other human-related disturbances within the CA					
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA		extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration of sediment inputs to the wetland		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources		0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment						
				Sum=	0	
				Final Score=	0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>					
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>					
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods					
	leveling or other grading not to the natural contour					
	tillage, plowing (but excluding disking for enhancement of native plants)					
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland					
	excavation					
	ditch cleaning or dredging in or adjacent to the wetland					
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments					
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil		>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration		long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration		frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
				Sum=	0	
				Final Score=	0.00	

Wetland ID:	WL-9
Date:	8/23/17
Observer:	Marina Dulmage, Deborah Bear
Latitude & Longitude (decimal degrees):	45.652755, -62.664731

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

<i>Results for this Assessment Area (AA):</i>						
<b>Wetland Functions or Other Attributes:</b>	<b>Function Score (Normalised)</b>	<b>Function Rating</b>	<b>Benefits Score (Normalised)</b>	<b>Benefits Rating</b>	<b>Function Score (raw)</b>	<b>Benefits Score (raw)</b>
Water Storage & Delay (WS)	2.83	Moderate	0.55	Lower	3.76	1.34
Stream Flow Support (SFS)	1.25	Lower	0.00	Lower	0.67	0.00
Water Cooling (WC)	2.67	Moderate	1.45	Lower	1.78	0.93
Sediment Retention & Stabilisation (SR)	0.93	Lower	10.00	Higher	3.59	10.00
Phosphorus Retention (PR)	1.10	Lower	10.00	Higher	4.50	10.00
Nitrate Removal & Retention (NR)	2.16	Lower	10.00	Higher	4.81	10.00
Carbon Sequestration (CS)	4.50	Moderate			6.42	
Organic Nutrient Export (OE)	5.20	Moderate			4.13	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	6.52	Moderate	4.30	Moderate	5.93	3.64
Amphibian & Turtle Habitat (AM)	8.43	Higher	3.84	Moderate	7.88	3.93
Waterbird Feeding Habitat (WBF)	6.05	Moderate	2.50	Moderate	4.85	2.50
Waterbird Nesting Habitat (WBN)	5.61	Higher	2.50	Moderate	4.64	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	5.38	Moderate	2.50	Moderate	4.46	2.50
Pollinator Habitat (POL)	7.10	Moderate	0.00	Lower	5.88	0.00
Native Plant Habitat (PH)	4.63	Moderate	3.97	Moderate	5.37	3.45
Public Use & Recognition (PU)			1.26	Lower		1.23
Wetland Sensitivity (Sens)			4.30	Moderate		3.55
Wetland Ecological Condition (EC)			6.32	Moderate		7.78
Wetland Stressors (STR) (higher score means more stress)			8.56	Higher		5.04
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	2.83	Moderate	0.55	Lower	3.76	1.34
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	2.23	Lower	10.00	Higher	5.63	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	5.00	Moderate	2.94	Moderate	4.53	2.58
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	6.71	Higher	4.14	Moderate	5.68	2.86
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	5.27	Moderate	2.77	Lower	5.56	2.71
WETLAND CONDITION (EC)			6.32	Moderate		7.78
WETLAND RISK (average of Sensitivity & Stressors)			8.21	Higher		4.29

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-10, Boat Harbour
Investigator Name:	Marina Dulmage, Amanda Facey
Date of Field Assessment:	23/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.650636
Longitude (decimal degrees):	-62.669998
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	8.21
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date: 23-Aug-17		Site Identifier: WL-10		Investigator: MLD, ANF	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:            Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>            GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>            For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.	
OF2	Ponded Area Within 1 km.	The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]	
OF3	Ponded Water & Wetland Within 1 km	The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]	
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all adjacent upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]	
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest vegetated land (but excluding row crops, lawn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and not separated. 50-500 m, but separated by those features. 0.5 - 5 km, and not separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]	
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]	
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]	
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]	

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	1	
		1 - 5 km	0	
	>5 km	0		
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
	>500 m	1		
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	0	
		1 - 2 km	1	
		2-5 km	0	
		5-10 km	0	
	>10 km	0		
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
	>40 km	0		
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
	More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	1		
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
	Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0		
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.141	[NR, Sens, SFSv, WCv, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
	Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1		

OF21	Degraded Water Downstream	The problem described above is <b>downslope from</b> the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	1	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	1	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry>WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	1	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]:</i>		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably is not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> ;		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0			
Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0			
Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0			
Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1			
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: Aug 23, 2017		Site Identifier: WL-10		Investigator: MLD, ANF	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>5</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/ hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>0</p> <p>1</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
F9	N Fixers	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	Exclude moss growing on trees and rocks. [CS, PH]
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	25-50% of the vegetated part of the AA.	1	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	
F12	Ground Irregularity	Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
		Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		
F13	Upland Inclusions	Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	[AM, NR, SBM]
		Intermediate.	1	
		Several (extensive micro-topography).	0	
		Within the AA, inclusions of upland are:		
F14	Soil Texture	Few or none.	1	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F15	Shorebird Feeding Habitats	Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and	1	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
F16	Herbaceous % of Vegetated Wetland	none, or <100 sq. m.	1	[AM, WBF, WBN]
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
F17	Forb Cover	<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	1	
		>95% of the vegetated part of the AA.	0	
F18	Sedge Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		AllForbCov
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	0	
F19	Dominance of Most Abundant Herbaceous Species	50-95% of the herbaceous part of the AA.	1	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		>95% of the vegetated part of the AA.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
F20	Invasive Plant Cover	those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	[EC, PH, POL, Sens]
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	0	
F22	Fringe Wetland	some (but <5%) of the upland edge.	1	[WBF, WBN, WCV, ]
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F23	Lacustrine Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[FR, PR, PU, WBF, WBN]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	1		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		AllSat2
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	1		
		50-95% of the AA.	0		AllWet
		>95% of the AA. True for many fringe wetlands.	0		
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	1		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	1		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	1		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	1		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) <b>ponded</b> (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	1		
		>95% of the water.	0		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of <b>open water</b> that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	<b>Open water</b> is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is <b>open</b> (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded1
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	1		
		100% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	1		
		30 - 49 m	0		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is <b>nearly flat</b> (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	1		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	1		
		25-75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
F38	Persistent Deepwater Area	Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	1		DeepPersis
		If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	1		
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	1		
F40	Isolated Island	Extensive.	0		
		The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a waterbird nest.	1	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	1		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
F43	Outflow Confinement	none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH)	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0		
		During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
F44	Tributary Channel	mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		Inflows
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
F45	Input Water Temperature	is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
		At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NR, PH, PR, SR, WS]	
F46	Throughflow Resistance	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
		During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
F47	pH Measurement	Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	1		
F48	TDS and/or Conductivity	bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
		The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
F49	Beaver Probability	was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g. Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
		The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NR, PR, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
F50	Groundwater Strength of Evidence	Conductivity is [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
F51	Internal Gradient	neither of above	1		TooSteep
		Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	1		
F50	Groundwater Strength of Evidence	unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
		Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PR, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	1		
F51	Internal Gradient	Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	0		
		The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	
		<2% or the AA has no surface water outlet (not even seasonally)	0		
F51	Internal Gradient	2-5%	1		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.				
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0	
		5 to 30%	0	
		30 to 60%	1	
		60 to 90%	0	
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0	
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):		[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0	
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0	
		2-5%	1	
		5-30%	0	
		>30%	0	
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0	
		yes, and created or expanded 20 - 100 years ago.	0	
		yes, and created or expanded 3-20 years ago.	0	
		yes, and created or expanded within last 3 years.	0	
		yes, but time of origin or expansion unknown.	0	
		unknown if new or expanded within 20 years or not.	1	
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0	
		burned 6-10 years ago.	0	
		burned 11-30 years ago.	0	
		burned >30 years ago, or no evidence of a burn and no data.	1	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]
		<25%	0	
		25-50%	1	
		>50%	0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1	
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0	
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: <i>[Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]</i>		[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0	
		<5% and inhabited building is within 100 m of the AA.	0	
		5-50% and no inhabited building is within 100 m of the AA.	0	
		5-50% and inhabited building is within 100 m of the AA.	0	
		50-95%, with or without inhabited building nearby.	1	
		>95% of the AA with or without inhabited building nearby.	0	
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i>		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%; if F61 was answered ">95%" (mostly never visited), SKIP to F65.	0	
		5-50%	1	
		50-95%	0	
		>95% of the AA.	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	1	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
		none of the above.	1	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0	[PH, PR]

BuffAIINat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>		<b>Data</b>
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S1	<b>Aberrant Timing of Water Inputs</b>		
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>		
	stormwater from impervious surfaces that drains directly to the wetland		
	water subsides from wastewater effluent, septic system leakage, snow storage areas, or irrigation		
	regular removal of surface or groundwater for irrigation or other consumptive use		
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland		
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)		
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch		
	artificial drains or ditches in or near the wetland		
	accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)		
	logging within the wetland		
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles		
	straightening, ditching, dredging, and/or lining of tributary channels		
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>		
		Severe (3 points)	Medium (2 points)
		Mild (1 point)	
	Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland
		<3 yrs ago	3-9 yrs ago
		<5% of wetland	10-100 yrs ago
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>		
	Input timing now vs. previously	shift of weeks	shift of days
		became very flashy or controlled	intermediate
	Flashiness or muting		became mildly flashy or controlled
			Sum=
			Final Score=
			0.00

S2	<b>Accelerated Inputs of Contaminants and/or Salts</b>		
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>		
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities		
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npril/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npril/default.asp?lang=En&amp;n=B85A1846-1</a> )		1
	road salt		
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA		
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>		
		Severe (3 points)	Medium (2 points)
		Mild (1 point)	
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way
		frequent and year-round	frequent but mostly seasonal
	Frequency & duration of input		infrequent & during high runoff events mainly
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater
			in more distant part of contributing area
			Sum=
			Final Score=
			0.67

S3	<b>Accelerated Inputs of Nutrients</b>		
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>		
	stormwater or wastewater effluent (including failing septic systems), landfills		
	fertilizers applied to lawns, ag lands, or other areas in the CA		
	livestock, dogs		
	artificial drainage of upslope lands		
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>		
		Severe (3 points)	Medium (2 points)
		Mild (1 point)	
	Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant
		frequent and year-round	frequent but mostly seasonal
	Frequency & duration of input		infrequent & during high runoff events mainly
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater
			in more distant part of contributing area
			Sum=
			Final Score=
			0.00

S4	<b>Excessive Sediment Loading from Contributing Area</b>					
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>					
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires					
	erosion from construction, in-channel machinery in the CA					
	erosion from off-road vehicles in the CA					
	erosion from livestock or foot traffic in the CA					
	stormwater or wastewater effluent					
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction					
	accelerated channel downcutting or headcutting of tributaries due to altered land use					
	other human-related disturbances within the CA					
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA		extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration of sediment inputs to the wetland		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources		0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment						
Sum=					0	
Final Score=					0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>					
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>					
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods					
	leveling or other grading not to the natural contour					
	tillage, plowing (but excluding disking for enhancement of native plants)					
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland					
	excavation					
	ditch cleaning or dredging in or adjacent to the wetland					
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments					
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil		>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland		current & ongoing	1-12 months ago	>1 yr ago	0
	Duration		long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration		frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
Sum=					0	
Final Score=					0.00	

Wetland ID:	WL-10
Date:	8/23/17
Observer:	Marina Dulmage, Amanda Facey
Latitude & Longitude (decimal degrees):	45.650636, -62.669998

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

<i>Results for this Assessment Area (AA):</i>						
<b>Wetland Functions or Other Attributes:</b>	<b>Function Score (Normalised)</b>	<b>Function Rating</b>	<b>Benefits Score (Normalised)</b>	<b>Benefits Rating</b>	<b>Function Score (raw)</b>	<b>Benefits Score (raw)</b>
Water Storage & Delay (WS)	0.49	Lower	1.52	Lower	1.90	2.23
Stream Flow Support (SFS)	10.00	Higher	3.44	Moderate	5.78	2.54
Water Cooling (WC)	5.96	Higher	4.82	Moderate	3.97	3.11
Sediment Retention & Stabilisation (SR)	0.00	Lower	10.00	Higher	2.75	10.00
Phosphorus Retention (PR)	1.82	Moderate	10.00	Higher	4.94	10.00
Nitrate Removal & Retention (NR)	2.09	Lower	10.00	Higher	4.79	10.00
Carbon Sequestration (CS)	2.77	Lower			5.64	
Organic Nutrient Export (OE)	6.28	Higher			4.98	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	8.06	Higher	3.80	Moderate	5.08	2.69
Aquatic Invertebrate Habitat (INV)	6.53	Moderate	6.54	Higher	5.94	4.80
Amphibian & Turtle Habitat (AM)	6.35	Higher	5.28	Moderate	6.82	4.90
Waterbird Feeding Habitat (WBF)	7.66	Higher	6.67	Moderate	6.14	6.67
Waterbird Nesting Habitat (WBN)	5.69	Higher	2.50	Moderate	4.71	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	7.33	Higher	2.50	Moderate	6.07	2.50
Pollinator Habitat (POL)	7.14	Moderate	0.00	Lower	5.92	0.00
Native Plant Habitat (PH)	5.16	Higher	4.61	Moderate	5.58	3.99
Public Use & Recognition (PU)			3.16	Moderate		2.58
Wetland Sensitivity (Sens)			7.49	Higher		4.58
Wetland Ecological Condition (EC)			5.86	Moderate		7.50
Wetland Stressors (STR) (higher score means more stress)			7.33	Higher		4.52
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	0.49	Lower	1.52	Lower	1.90	2.23
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	0.81	Lower	10.00	Higher	5.09	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	7.40	Higher	5.74	Moderate	5.55	4.14
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	6.72	Higher	8.39	Higher	5.68	5.01
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	6.08	Moderate	3.15	Lower	5.96	3.08
WETLAND CONDITION (EC)			5.86	Moderate		7.50
WETLAND RISK (average of Sensitivity & Stressors)			9.40	Higher		4.55

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-11, Boat Harbour
Investigator Name:	Marina Dulmage, Amanda Facey
Date of Field Assessment:	27/09/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.6518
Longitude (decimal degrees):	-62.6738
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~2.5
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	no
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date: 27-Sep-17		Site Identifier: WL-11		Investigator: MLD, ANF	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:</p> <p>Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>  GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a></p> <p>For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one.		This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.	
		New Brunswick	0		
		Nova Scotia	1		
		Prince Edward Island	0		
		Newfoundland-Labrador	0		
OF2	Ponded Area Within 1 km.	The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is:		"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]	
		<0.01 hectare (about 10 m x 10 m)	0		
		0.01 - 0.1 hectare	0		
		0.1 - 1 hectare	0		
		1 to 10 hectares	1		
		10 to 100 hectares	0		
		>100 hectares	0		
OF3	Ponded Water & Wetland Within 1 km	The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is:		See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]	
		<0.01 hectare (about 10 m x 10 m)	0		
		0.01 - 0.1 hectare	0		
		0.1 - 1 hectare	0		
		1 to 10 hectares	1		
		10 to 100 hectares	0		
		>100 hectares	0		
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all adjacent upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is:		See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]	
		<0.01 hectare (about 10 m x 10 m)	0		
		0.01 - 0.1 hectare	0		
		0.1 - 1 hectare	0		
		1 to 10 hectares	1		
		10 to 100 hectares	0		
		100 to 1000 hectares	0		
		>1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0		
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest vegetated land (but excluding row crops, lawn, conifer plantation) larger than 375 hectares (about 2 km on a side), is:		To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]	
		<50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes].	0		
		<50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation.	0		
		50-500 m, and not separated.	1		
		50-500 m, but separated by those features.	0		
		0.5 - 5 km, and not separated.	0		
		0.5 - 5 km, but separated by those features.	0		
		none of the above (the closest patches or corridors which are that large are >5 km away).	0		
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	1	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]	
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]	
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is:		In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]	
		<5% of the land.	0		
		5 to 20% of the land.	0		
		20 to 60% of the land.	0		
		60 to 90% of the land.	1		
		>90% of the land. SKIP to OF10.	0		

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	0	
>5 km	1			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
>500 m	1			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	0	
		1 - 2 km	1	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0			
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.167	[NR, Sens, SFSv, WCv, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1			

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	0	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	1	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
OF24	Transport From Upslope	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[NRv, PRv, SRv, WSV]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF25	Aspect	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[AM, NR, SFS, WC, WS, ]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF26	Internal Flow Distance (Path Length)	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	1	
		Southward (S, SW), south-facing contributing area.	0	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
		The horizontal flow distance from the wetland's inlet to outlet is:		
		<10 m	0	
10 - 50 m	0			
50 - 100 m	0			
100 - 1000 m	0			
1- 2 km	0			
>2 km, or wetland lacks an inlet and/or outlet.	1			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]:</i>		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanctsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanctsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably is not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species).	0	
none of the above, or no data.	1			
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: Sept 27, 2017		Site Identifier: WL-11		Investigator:MLD, ANF	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	Fen_ Marsh
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>2</p> <p>0</p> <p>3</p> <p>4</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>1</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/ hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is: Few or none that meet these criteria.	0	Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	1	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: <1% or none	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: <5% of the vegetated part of the AA.	1	Exclude moss growing on trees and rocks. [CS, PH]
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is: Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is: Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Intermediate.	0	
		Several (extensive micro-topography).	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are: Few or none.	1	[AM, NR, SBM]
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)] Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA]. none, or <100 sq. m.	1	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
			0	
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is: <5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	[AM, WBF, WBN]
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	1	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of: <5% of the herbaceous part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		5-25% of the herbaceous part of the AA.	1	
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	0	
		>95% of the herbaceous part of the AA.	0	
F18	Sedge Cover	Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy: <5% of the vegetated area, or none.	1	[CS]
		5-50% of the vegetated area.	0	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
			0	
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. Invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	[EC, PH, POL, Sens]
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species none of the upland edge (invasives apparently absent), or AA has no upland edge.	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		some (but <5%) of the upland edge.	1	
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	1		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
	99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1	
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
	>95% of the AA. True for many fringe wetlands.	0		AllWet	
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	1		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
	>75% of the water is shaded.	0			
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
	>95% of the AA.	0			
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
	>2 m change.	0			
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			1		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation is most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
	>2 m deep. True for many fringe wetlands.	0			
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
	Neither of above. There are 3 or more depth classes and none occupy >50%.	0			
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
	>95% of the water.	0			
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, If false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
	100% of the ponded water.	0		AllOpenPond	
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
	> 100 m, or open water is absent at that time.	0			
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
F38	Persistent Deepwater Area	Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		DeepPersis
		If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/ed/DC/catalogue-E.asp">http://w.snb.ca/geonb1/ed/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	1		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	1		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0		
F44	Tributary Channel	is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		Inflows
		At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRV, PH, PRV, SRV]	
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
F47	pH Measurement	bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
		The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
F48	TDS and/or Conductivity	was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		See above for measurement guidance. [FR, INV, NRV, PH, PRV, Sens]
		neither of above. Enter "1".	1		
		The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information):			
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
F49	Beaver Probability	Conductivity is: [enter the reading in µS/cm in the column to the right]:			[FA, FR, PH, SBM, Sens, WBF, WBN]
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F50	Groundwater Strength of Evidence	Use of the AA by beaver during the past 5 years is (select most applicable ONE):			Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRV, SFS, WC, WS, ]
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1		
F51	Internal Gradient	Select first applicable choice.			This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:			TooSteep
		<2% or the AA has no surface water outlet (not even seasonally)	0		
		2-5%	1		
		6-10%	0		
F51	Internal Gradient	>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	1
		60 to 90%	0
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	1
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0
		Do not include upturned trees as potential den sites. [POL, SBM]	
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0
		yes, and created or expanded 20 - 100 years ago.	1
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	0
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, Fav, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	1
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	0
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[Fav, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	[PH, PR]
			0

BuffAllNat

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

S1	Aberrant Timing of Water Inputs		Data		
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>				
	stormwater from impervious surfaces that drains directly to the wetland				
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation				
	regular removal of surface or groundwater for irrigation or other consumptive use				
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland				
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)				
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch				
	artificial drains or ditches in or near the wetland				
	accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)				
	logging within the wetland				
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles				
	straightening, ditching, dredging, and/or lining of tributary channels				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	0
	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>				
	Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0
	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0
				Sum=	0
				Final Score=	0.00

S2	Accelerated Inputs of Contaminants and/or Salts		Data		
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities		1		
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npril/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/inrp-npril/default.asp?lang=En&amp;nav=B85A1846-1</a> )				
	road salt				
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	1
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	1
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	1
				Sum=	3
				Final Score=	0.33

S3	Accelerated Inputs of Nutrients		Data		
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills		1		
	fertilizers applied to lawns, ag lands, or other areas in the CA				
	livestock, dogs				
	artificial drainage of upslope lands				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	1
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	1
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	1
				Sum=	3
				Final Score=	0.33

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-11
Date:	9/27/17
Observer:	MLD, ANF
Latitude & Longitude (decimal degrees):	45.6518, -62.6738

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	1.83	Lower	0.00	Lower	2.97	0.42
Stream Flow Support (SFS)	3.44	Moderate	2.44	Moderate	1.83	1.81
Water Cooling (WC)	4.25	Moderate	0.36	Lower	2.83	0.23
Sediment Retention & Stabilisation (SR)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Phosphorus Retention (PR)	2.80	Moderate	3.32	Moderate	5.55	3.33
Nitrate Removal & Retention (NR)	0.00	Lower	6.25	Higher	3.91	7.50
Carbon Sequestration (CS)	3.81	Moderate			6.11	
Organic Nutrient Export (OE)	6.19	Higher			4.91	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	6.25	Moderate	#DIV/0!	#DIV/0!	5.82	#DIV/0!
Amphibian & Turtle Habitat (AM)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Waterbird Feeding Habitat (WBF)	0.00	Lower	0.00	Lower	0.00	0.00
Waterbird Nesting Habitat (WBN)	0.00	Lower	0.00	Lower	0.00	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	9.06	Higher	3.33	Moderate	7.50	3.33
Pollinator Habitat (POL)	8.47	Higher	3.33	Moderate	7.01	3.33
Native Plant Habitat (PH)	4.95	Higher	6.86	Higher	5.50	5.95
Public Use & Recognition (PU)			1.17	Lower		1.17
Wetland Sensitivity (Sens)			6.56	Higher		4.28
Wetland Ecological Condition (EC)			6.32	Moderate		7.78
Wetland Stressors (STR) (higher score means more stress)			7.58	Higher		4.62
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	1.83	Lower	0.00	Lower	2.97	0.42
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	5.72	Moderate	#DIV/0!	#DIV/0!	4.83	#DIV/0!
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	8.32	Higher	5.19	Moderate	7.09	5.08
WETLAND CONDITION (EC)			6.32	Moderate		7.78
WETLAND RISK (average of Sensitivity & Stressors)			8.94	Higher		4.45

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 12, Boat Harbour
Investigator Name:	Marina Dulmage, Amanda Facey
Date of Field Assessment:	Aug 25 2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.654280
Longitude (decimal degrees):	-62.673006
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~3.56
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	25-Aug-17	Site Identifier: WL-12	Investigator: MLD, ANF	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [ <i>This is nearly always the answer in relatively undeveloped landscapes.</i> ]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and not separated. 50-500 m, but separated by those features. 0.5 - 5 km, and not separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. <b>SKIP to OF10.</b>	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]
OF9	Type of Land Cover	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]

	Alteration	Impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		Bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria. [FAV, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	1	
		1 - 5 km	0	
		>5 km	0	
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAV, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	1	
		>500 m	0	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
		none of the above (the closest patches or corridors that large are >1 km away).	0	
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	0	
		1 - 2 km	1	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
		>40 km	0	
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1	
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.055	[NR, Sens, SFSv, WCV, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	
OF21	Degraded Water Downstream	The problem described above is downslope from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	

		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is: <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	[NR, PR, Sens, SR, WS]
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : <10% 10 to 25% >25%	1 0 0	[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is: Mostly true Somewhat true Mostly untrue	0 1 0	[NRv, PRv, SRv, WSV]
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: Northward (N, NE), north-facing contributing area. Southward (S, SW), south-facing contributing area. other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0 0 1	[AM, NR, SFS, WC, WS, ]
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is: <10 m 10 - 50 m 50 - 100 m 100 - 1000 m 1 - 2 km >2 km, or wetland lacks an inlet and/or outlet.	0 0 0 0 0 1	Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry>WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: [mark just the first choice that is true]: is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a> has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions. is probably is not accessed by any anadromous fish species but is known or likely to have other fish at least seasonally. is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0 0 0 1	Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented [mark all applicable]: Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SuppInfo file. Presence of one or more of the amphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file. Presence of one or more of the waterbird species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file. Presence of one or more of the nesting songbird or raptor species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file, during their nesting season (May-July for most species). none of the above, or no data.	0 0 0 0 1	Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]
OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.	0	[PU]

OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 25, 2017		Site Identifier: WL-12		Investigator: MLD, ANF	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>2</p> <p>4</p> <p>2</p> <p>2</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>0</p> <p>0</p> <p>1</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	0	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	1	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
		Intermediate.	0	
		Several (extensive micro-topography).	1	
F13	Upland Inclusions	Within the AA, inclusions of upland are:		[AM, NR, SBM]
		Few or none.	0	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
F14	Soil Texture	Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	1	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
F15	Shorebird Feeding Habitats	Peat or organic <40 cm deep.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	1000 - 10,000 sq. m.	0	[AM, WBF, WBN]
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
F17	Forb Cover	25-50% of the vegetated part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		50-95% of the vegetated part of the AA.	1	
		>95% of the vegetated part of the AA.	0	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
F18	Sedge Cover	5-25% of the herbaceous part of the AA.	0	[CS]
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	1	
		>95% of the herbaceous part of the AA.	0	
		Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		
F19	Dominance of Most Abundant Herbaceous Species	<5% of the vegetated area, or none.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		5-50% of the vegetated area.	1	
		50-95% of the vegetated area.	0	
F20	Invasive Plant Cover	>95% of the vegetated area.	0	[EC, PH, POL, Sens]
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. Invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
F21	Invasive Cover Along Upland Edge	invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
F22	Fringe Wetland	none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	[WBF, WBN, WCV, ]
		some (but <5%) of the upland edge.	0	
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F23	Lacustrine Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[FR, PR, PU, WBF, WBN]
		The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	1		AllSat2
	99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat1	
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		AllWet
	>95% of the AA. True for many fringe wetlands.	0			
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
	>75% of the water is shaded.	0			
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
	>95% of the AA.	0			
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
	>2 m change.	0			
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	1		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
	>2 m deep. True for many fringe wetlands.	0			
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
	Neither of above. There are 3 or more depth classes and none occupy >50%.	0			
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
	>95% of the water.	1			
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		NoOpenPonded1
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
	100% of the ponded water.	0		AllOpenPond	
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
	>75% of the water edge.	0			

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.smb.ca/geon11e/DC/catalogue-E.asp">http://w.smb.ca/geon11e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH measurement)	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	1		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS.]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	1
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	1
		2-5%	0
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no).	0 Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	1
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0 [PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0 [AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0 [PH, PR]

BuffAIINat

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

S1	<b>Aberrant Timing of Water Inputs</b>		<b>Data</b>
<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>			
stormwater from impervious surfaces that drains directly to the wetland			
water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation			
regular removal of surface or groundwater for irrigation or other consumptive use			
flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland			
a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)			
excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch			
artificial drains or ditches in or near the wetland			
accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)			
logging within the wetland			
subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles			
straightening, ditching, dredging, and/or lining of tributary channels			
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
	Severe (3 points)	Medium (2 points)	Mild (1 point)
Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland
When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>			
Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes
Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled
			Sum=
			Final Score=
			0.00

S2	<b>Accelerated Inputs of Contaminants and/or Salts</b>		<b>Data</b>
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>			
stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities			
metals & chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;n=B85A1846-1</a> )			
road salt			
spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA			
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
	Severe (3 points)	Medium (2 points)	Mild (1 point)
Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area
			Sum=
			Final Score=
			0.56

S3	<b>Accelerated Inputs of Nutrients</b>		<b>Data</b>
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>			
stormwater or wastewater effluent (including failing septic systems), landfills			
fertilizers applied to lawns, ag lands, or other areas in the CA			
livestock, dogs			
artificial drainage of upslope lands			
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
	Severe (3 points)	Medium (2 points)	Mild (1 point)
Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential
Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly
AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area
			Sum=
			Final Score=
			0.00

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				0
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				0
				Final Score=
				0.00

Wetland ID:	WL-12
Date:	8/25/17
Observer:	Marina Dulmage, Amanda Facey
Latitude & Longitude (decimal degrees):	45.654280, -62.673006

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	7.25	Higher	0.60	Lower	7.28	1.39
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	0.00	Lower	0.00	Lower	0.00	0.00
Sediment Retention & Stabilisation (SR)	10.00	Higher	10.00	Higher	10.00	10.00
Phosphorus Retention (PR)	10.00	Higher	10.00	Higher	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	Higher	10.00	Higher	10.00	10.00
Carbon Sequestration (CS)	4.29	Moderate			6.32	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	4.01	Lower	4.37	Moderate	4.86	3.67
Amphibian & Turtle Habitat (AM)	5.68	Moderate	5.39	Moderate	6.48	4.98
Waterbird Feeding Habitat (WBF)	5.85	Moderate	2.50	Moderate	4.69	2.50
Waterbird Nesting Habitat (WBN)	3.77	Moderate	2.50	Moderate	3.12	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	9.37	Higher	2.50	Moderate	7.76	2.50
Pollinator Habitat (POL)	8.79	Higher	0.00	Lower	7.28	0.00
Native Plant Habitat (PH)	4.99	Higher	5.78	Moderate	5.51	5.01
Public Use & Recognition (PU)			2.03	Lower		1.78
Wetland Sensitivity (Sens)			7.73	Higher		4.65
Wetland Ecological Condition (EC)			10.00	Higher		10.00
Wetland Stressors (STR) (higher score means more stress)			3.81	Moderate		3.01
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	7.25	Higher	0.60	Lower	7.28	1.39
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	10.00	Higher	9.54	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	1.51	Lower	2.70	Lower	3.04	2.45
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	4.69	Moderate	5.38	Moderate	4.67	3.49
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	8.76	Higher	3.84	Lower	7.30	3.76
WETLAND CONDITION (EC)			10.00	Higher		10.00
WETLAND RISK (average of Sensitivity & Stressors)			6.01	Moderate		3.83

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 13a,13b,13c, Boat Harbour
Investigator Name:	Christina Laflemme, Brady Leights
Date of Field Assessment:	25/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.653709
Longitude (decimal degrees):	-62.651348
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~4.45
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	06-Sep-17	Site Identifier: WL-13a,13b,13c	Investigator: CL, BL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all adjacent upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest vegetated land (but excluding row crops, lawn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and not separated. 50-500 m, but separated by those features. 0.5 - 5 km, and not separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[Fav, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
		>500 m	1	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	1	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0			
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.067	[NR, Sens, SFSv, WCv, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1			

OF21	Degraded Water Downstream	The problem described above is <b>downslope from the AA</b> , and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	1	
		Southward (S, SW), south-facing contributing area.	0	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	1	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 25, 2017		Site Identifier: WL-13a,b,c		Investigator: CL, BL	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:		Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale ( <i>Myrica gale</i> ) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]	
		A. Moss and/or lichen cover more than 25% of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.			
		A1. Surface water is usually absent or, if present, pH is typically <4.5 and conductivity is usually <100 µS/cm (<64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge ( <i>Carex rariflora</i> ). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is <4.0.	0		Fen_
		A2. Not A1. Surface water, if present, has pH typically >4.5 and conductivity is usually >100 µS/cm (>64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (<2 m).	0		
		B. Moss and/or lichen cover less than 25% of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:			
		B1. Trees and shrubs taller than 1 m comprise more than 25% of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).	0		
		B2. Not B1. Tree & tall shrubs comprise less than 25% of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.	1		Marsh
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	If the AA is smaller than 1 ha, mark <b>all other</b> types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]	
		A1	0		
		A2	0		
		B1	0		
		B2	0		
F3	Woody Height & Form Diversity	Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature: 6 if >95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if <5%, 0 if none. If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%. Coniferous trees (may include tamarack) taller than 3 m.		Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry ( <i>Morella</i> ), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is <25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]	
		deciduous trees taller than 3 m.	1		
		coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.	0		
		deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.	1		
		coniferous or ericaceous shrubs <1 m tall not directly below the canopy of taller vegetation.	0		
		deciduous shrubs or trees <1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.	1		
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	Determine which two woody plant species comprise the greatest portion of the low (<3 m) woody cover. Then choose one: those species together comprise > 50% of such cover. those species together do not comprise > 50% of such cover.		[PH, POL, SBM, Sens]	
		those species together comprise > 50% of such cover.	0		
		those species together do not comprise > 50% of such cover.	0		
F5	Woody Diameter Classes	Mark ALL the types that comprise >5% of the woody canopy cover in the AA or >5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.		Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]	
		coniferous, 1-9 cm diameter and >1 m tall.	0		
		broad-leaved deciduous 1-9 cm diameter and >1 m tall.	0		
		coniferous, 10-19 cm diameter.	0		
		broad-leaved deciduous 10-19 cm diameter.	0		
		coniferous, 20-40 cm diameter.	0		
		broad-leaved deciduous 20-40 cm diameter.	0		
		coniferous, >40 cm diameter.	0		
		broad-leaved deciduous >40 cm diameter.	0		
F6	Height Class Interspersion	Follow the key below and mark the ONE row that best describes MOST of the AA:		[AM, INV, NR, PH, SBM, Sens]	
		A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise >70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.			
		A1. The two height classes are mostly scattered and intermixed throughout the AA.	0		
		A2. Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.	0		
		B. Either the vegetation shorter than 1 m comprises >70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:			
		B1. The less prevalent height class is mostly scattered and intermixed within the prevalent one.	0		
		B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.	0		

F7	Large Snags (Dead Standing Trees)	The number of large snags (diameter >20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:		Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]
		None, or fewer than 8/ hectare which exceed this diameter.	0	
		Several (>8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.	0	
		Several (>8/hectare) but above not true.	0	
F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	0	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
		Intermediate.	0	
F13	Upland Inclusions	Several (extensive micro-topography).	1	[AM, NR, SBM]
		Within the AA, inclusions of upland are:		
		Few or none.	0	
F14	Soil Texture	Intermediate (1 - 10% of vegetated part of the AA).	1	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
F15	Shorebird Feeding Habitats	Peat or organic <40 cm deep.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: (include also any area that is adjacent to the AA).		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	1000 - 10,000 sq. m.	0	[AM, WBF, WBN]
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
F17	Forb Cover	50-95% of the vegetated part of the AA.	1	[AM, WBF, WBN]
		>95% of the vegetated part of the AA.	0	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	1	
F18	Sedge Cover	25-50% of the herbaceous part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		50-95% of the herbaceous part of the AA.	0	
		>95% of the herbaceous part of the AA.	0	
		Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy:		
		<5% of the vegetated area, or none.	0	
F19	Dominance of Most Abundant Herbaceous Species	5-50% of the vegetated area.	1	[CS]
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
F20	Invasive Plant Cover	those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying SupplInfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	[EC, PH, POL, Sens]
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
		some (but <5%) of the upland edge.	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	

F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[WBF, WBN, WCV, ]	
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]	
F24	% of AA Without Surface Water	The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	AllSat2 AllSat1
		<1% - In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	1		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of AA that is Flooded Only Seasonally	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	Annual Water Fluctuation Range	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualizing where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA.	0		
F28	Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100m)? If so, enter "1" in column D and SKIP TO F42 (Connection).	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	TooSmall
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	1		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	1		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
		100% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	1		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	1		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is: <1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38. 1-25% of the emergent vegetation. 25-75% of the emergent vegetation. >75%, of the emergent vegetation.	0 0 0 1	Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly: Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water. Intermediate. Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0 0 0 1	[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42 (Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is: Little or none. Intermediate. Extensive.	0 0 0	For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network] persistent (surface water flows out for >9 months/year). seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive). temporary (surface water flows out for <14 days, not necessarily consecutive). none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length SKIP to F47 (pH measurement) no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	1 0 0 0 0	Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Network shapefiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water: mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features. is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0 1 0	"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: (select only the ONE encountered by most of the incoming water). Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. bumps into herbaceous vegetation but mostly remains in fairly straight channels. bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0 1 0 0 0	[FA, FR, INV, NR, OE, PR, SR, WS]	
F47	pH Measurement	The pH in most of the AA's surface water: was measured, and is: [enter the reading in the column to the right]. was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1". neither of above. Enter "1".	0 1 1	Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information): TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]. Conductivity is: [enter the reading in µS/cm in the column to the right]. was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1". neither of above	0 0 1	See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE): evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1 0 0	[FA, FR, PH, SBM, Sens, WBF, WBN]	
F50	Groundwater Strength of Evidence	Select first applicable choice. Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5. Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	0 0 0	Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
F51	Internal Gradient	The gradient along most of the flow path within the AA is: <2% or the AA has no surface water outlet (not even seasonally) 2-5% 6-10% >10%	1 0 0 0	This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.				
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0	
		5 to 30%	0	
		30 to 60%	0	
		60 to 90%	1	
	>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55	0		
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):		[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	1	
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0	
		2-5%	1	
		5-30%	0	
		>30%	0	
F55	Cliffs or Sleep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0	
		yes, and created or expanded 20 - 100 years ago.	0	
		yes, and created or expanded 3-20 years ago.	0	
		yes, and created or expanded within last 3 years.	0	
		yes, but time of origin or expansion unknown.	1	
	unknown if new or expanded within 20 years or not.	0		
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0	
		burned 6-10 years ago.	0	
		burned 11-30 years ago.	0	
		burned >30 years ago, or no evidence of a burn and no data.	1	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]
		<25%	1	
		25-50%	0	
		>50%	0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1	
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0	
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]		[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0	
		<5% and inhabited building is within 100 m of the AA.	0	
		5-50% and no inhabited building is within 100 m of the AA.	0	
		5-50% and inhabited building is within 100 m of the AA.	0	
		50-95%, with or without inhabited building nearby.	0	
		>95% of the AA with or without inhabited building nearby.	1	
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above].		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1	
		5-50%	0	
		50-95%	0	
		>95% of the AA.	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorized boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
	none of the above.	0		
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0	[PH, PR]

BuffAllNat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1	<p><b>Aberrant Timing of Water Inputs</b></p> <p><i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i></p> <p>stormwater from impervious surfaces that drains directly to the wetland</p> <p>water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation</p> <p>regular removal of surface or groundwater for irrigation or other consumptive use</p> <p>flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland</p> <p>a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)</p> <p>excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch</p> <p>artificial drains or ditches in or near the wetland</p> <p>accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)</p> <p>logging within the wetland</p> <p>subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles</p> <p>straightening, ditching, dredging, and/or lining of tributary channels</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Spatial extent of timing shift within the wetland</td> <td style="text-align: center;">&gt;95% of wetland</td> <td style="text-align: center;">5-95% of wetland</td> <td style="text-align: center;">&lt;5% of wetland</td> <td style="text-align: center;">0</td> </tr> <tr> <td>When most of the timing shift began</td> <td style="text-align: center;">&lt;3 yrs ago</td> <td style="text-align: center;">3-9 yrs ago</td> <td style="text-align: center;">10-100 yrs ago</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="5"><i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i></td> </tr> <tr> <td>Input timing now vs. previously</td> <td style="text-align: center;">shift of weeks</td> <td style="text-align: center;">shift of days</td> <td style="text-align: center;">shift of hours or minutes</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Flashiness or muting</td> <td style="text-align: center;">became very flashy or controlled</td> <td style="text-align: center;">intermediate</td> <td style="text-align: center;">became mildly flashy or controlled</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;">0.00</td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	0	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0	<b>Sum=</b>				0	<b>Final Score=</b>				0.00
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S2	<p><b>Accelerated Inputs of Contaminants and/or Salts</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities</p> <p>metals &amp; chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/npr-npri/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/npr-npri/default.asp?lang=En&amp;nav=B85A1846-1</a>)</p> <p>road salt</p> <p>spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Usual toxicity of most toxic contaminants</td> <td style="text-align: center;">industrial effluent, mining waste, unmanaged landfill</td> <td style="text-align: center;">cropland, managed landfill, pipeline or transmission rights-of-way</td> <td style="text-align: center;">low density residential</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td style="text-align: center;">frequent and year-round</td> <td style="text-align: center;">frequent but mostly seasonal</td> <td style="text-align: center;">infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">3</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td style="text-align: center;">0 - 15 m</td> <td style="text-align: center;">15-100 m or in groundwater</td> <td style="text-align: center;">in more distant part of contributing area</td> <td style="text-align: center;">3</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;">9</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;">1.00</td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	3	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3	<b>Sum=</b>				9	<b>Final Score=</b>				1.00
	Severe (3 points)	Medium (2 points)	Mild (1 point)																												
Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	3																											
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<b>Sum=</b>				9																											
<b>Final Score=</b>				1.00																											

S3	<p><b>Accelerated Inputs of Nutrients</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills</p> <p>fertilizers applied to lawns, ag lands, or other areas in the CA</p> <p>livestock, dogs</p> <p>artificial drainage of upslope lands</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Type of loading</td> <td style="text-align: center;">high density of unmaintained septic, some types of industrial sources</td> <td style="text-align: center;">moderate density septic, cropland, secondary wastewater treatment plant</td> <td style="text-align: center;">livestock, pets, low density residential</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td style="text-align: center;">frequent and year-round</td> <td style="text-align: center;">frequent but mostly seasonal</td> <td style="text-align: center;">infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">3</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td style="text-align: center;">0 - 15 m</td> <td style="text-align: center;">15-100 m or in groundwater</td> <td style="text-align: center;">in more distant part of contributing area</td> <td style="text-align: center;">1</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;">6</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;">0.67</td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	1	<b>Sum=</b>				6	<b>Final Score=</b>				0.67
	Severe (3 points)	Medium (2 points)	Mild (1 point)																												
Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2																											
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<b>Final Score=</b>				0.67																											

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	2
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	3
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	2
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	3
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.83
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-13a,b,c
Date:	9/6/17
Observer:	CL, BL
Latitude & Longitude (decimal degrees):	45.653709 Lat, -62.651348 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	0.97	Lower	0.00	Lower	2.28	0.17
Stream Flow Support (SFS)	4.58	Moderate	2.99	Moderate	2.44	2.21
Water Cooling (WC)	1.92	Lower	2.12	Moderate	1.28	1.37
Sediment Retention & Stabilisation (SR)	2.56	Moderate	10.00	Higher	4.75	10.00
Phosphorus Retention (PR)	2.72	Moderate	10.00	Higher	5.50	10.00
Nitrate Removal & Retention (NR)	0.81	Lower	10.00	Higher	4.39	10.00
Carbon Sequestration (CS)	3.83	Moderate			6.12	
Organic Nutrient Export (OE)	5.41	Moderate			4.29	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	7.73	Higher	2.31	Moderate	4.88	1.64
Aquatic Invertebrate Habitat (INV)	7.55	Higher	8.07	Higher	6.37	5.60
Amphibian & Turtle Habitat (AM)	8.14	Higher	6.31	Higher	7.73	5.60
Waterbird Feeding Habitat (WBF)	7.72	Higher	2.50	Moderate	6.19	2.50
Waterbird Nesting Habitat (WBN)	8.05	Higher	2.50	Moderate	6.66	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	9.81	Higher	2.50	Moderate	8.12	2.50
Pollinator Habitat (POL)	7.80	Higher	0.00	Lower	6.46	0.00
Native Plant Habitat (PH)	5.76	Higher	5.61	Moderate	5.84	4.86
Public Use & Recognition (PU)			1.81	Lower		1.62
Wetland Sensitivity (Sens)			3.21	Moderate		3.20
Wetland Ecological Condition (EC)			7.24	Higher		8.33
Wetland Stressors (STR) (higher score means more stress)			5.83	Higher		3.87
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	0.97	Lower	0.00	Lower	2.28	0.17
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	2.29	Lower	10.00	Higher	5.65	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	6.07	Moderate	6.07	Moderate	4.99	4.33
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	8.18	Higher	6.44	Higher	6.41	4.03
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	9.08	Higher	3.74	Lower	7.47	3.66
WETLAND CONDITION (EC)			7.24	Higher		8.33
WETLAND RISK (average of Sensitivity & Stressors)			4.61	Moderate		3.54

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-8, Boat Harbour
Investigator Name:	Christina Laflemme, Brady Leights
Date of Field Assessment:	08/09/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.660795
Longitude (decimal degrees):	-62.662170
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~0.53
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	08-Sep-17	Site Identifier: WL-14	Investigator: CL, BL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 1 0 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all adjacent upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest vegetated land (but excluding row crops, lawn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and not separated. 50-500 m, but separated by those features. 0.5 - 5 km, and not separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool-> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria. [FAV, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler->Line tool. Or use the GeoNB's Draw Line tool. [AM, FAV, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
>500 m	1			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Ponded Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
0.5 - 1 km, but separated by those features.	0			
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Ponded Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	1	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headdtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column.	0.0106	[NR, Sens, SFSv, WCv, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	1	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	1			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file, during their nesting season (May-July for most species), none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: Sept 8, 2017		Site Identifier: WL-14		Investigator: CL, BL	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>5</p> <p>0</p> <p>2</p> <p>0</p> <p>2</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
F9	N Fixers	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		
		<1% or none	1	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	Exclude moss growing on trees and rocks. [CS, PH]
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		
		<5% of the vegetated part of the AA.	1	
		5-25% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	25-50% of the vegetated part of the AA.	0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	
F12	Ground Irregularity	Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
		Several (extensive micro-topography).	1	
F13	Upland Inclusions	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		[AM, NR, SBM]
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
		Intermediate.	0	
F14	Soil Texture	Several (extensive micro-topography).	1	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Within the AA, inclusions of upland are:		
		Few or none.	0	
		Intermediate (1 - 10% of vegetated part of the AA).	1	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
F15	Shorebird Feeding Habitats	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Peat, to 40 cm depth or greater.	1	
		Peat or organic <40 cm deep.	0	
F16	Herbaceous % of Vegetated Wetland	Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	[AM, WBF, WBN]
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
F17	Forb Cover	>10,000 sq. m.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	0	
F18	Sedge Cover	50-95% of the herbaceous part of the AA.	1	[CS]
		>95% of the herbaceous part of the AA.	0	
		Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		
		<5% of the vegetated area, or none.	1	
		5-50% of the vegetated area.	0	
F19	Dominance of Most Abundant Herbaceous Species	50-95% of the vegetated area.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		>95% of the vegetated area.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
F20	Invasive Plant Cover	those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	[EC, PH, POL, Sens]
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. Invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
F22	Fringe Wetland	some (but <5%) of the upland edge.	0	[WBF, WBN, WCV, ]
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F23	Lacustrine Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[FR, PR, PU, WBF, WBN]
		The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SR, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	1		
		1-20% of the AA.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	0		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, If false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
		100% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
		>100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a waterbird nest.	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement).	0		Outnone
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	1		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS.]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	0
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	0
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0
		Do not include upturned trees as potential den sites. [POL, SBM]	
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	1
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible <u>in</u> (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FA, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0
		[PH, PU]	
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0
		[AM, PU, WBF, WBN]	
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0
		[PH, PR]	

BuffAINat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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<b>S1</b>	<b>Aberrant Timing of Water Inputs</b>				
<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>					
stormwater from impervious surfaces that drains directly to the wetland					
water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation					
regular removal of surface or groundwater for irrigation or other consumptive use					
flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland					
a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)					
excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch					
artificial drains or ditches in or near the wetland					
accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)					
logging within the wetland					
subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles					
straightening, ditching, dredging, and/or lining of tributary channels					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of timing shift within the wetland		>95% of wetland	5-95% of wetland	<5% of wetland	0
When most of the timing shift began		<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					
Input timing now vs. previously		shift of weeks	shift of days	shift of hours or minutes	0
Flashiness or muting		became very flashy or controlled	intermediate	became mildly flashy or controlled	0
				Sum=	0
				Final Score=	0.00

<b>S2</b>	<b>Accelerated Inputs of Contaminants and/or Salts</b>				
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities					
metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/npr-npri/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/npr-npri/default.asp?lang=En&amp;nav=B85A1846-1</a> )					
road salt					
spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Usual toxicity of most toxic contaminants		industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	2
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	2
				Sum=	7
				Final Score=	0.78

<b>S3</b>	<b>Accelerated Inputs of Nutrients</b>				
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills					
fertilizers applied to lawns, ag lands, or other areas in the CA					
livestock, dogs					
artificial drainage of upslope lands					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Type of loading		high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	2
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	2
				Sum=	6
				Final Score=	0.67

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				0
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				0
				Final Score=
				0.00

Wetland ID:	WL-14
Date:	9/8/17
Observer:	CL, BL
Latitude & Longitude (decimal degrees):	45.660795 Lat, -62.662170 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	7.07	Higher	1.17	Lower	7.14	1.90
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	0.60	Lower	0.00	Lower	0.40	0.00
Sediment Retention & Stabilisation (SR)	10.00	Higher	10.00	Higher	10.00	10.00
Phosphorus Retention (PR)	10.00	Higher	10.00	Higher	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	Higher	10.00	Higher	10.00	10.00
Carbon Sequestration (CS)	1.80	Lower			5.21	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	3.03	Lower	3.16	Moderate	4.45	3.05
Amphibian & Turtle Habitat (AM)	2.50	Lower	4.37	Moderate	4.85	4.29
Waterbird Feeding Habitat (WBF)	5.05	Moderate	2.50	Moderate	4.05	2.50
Waterbird Nesting Habitat (WBN)	3.70	Moderate	2.50	Moderate	3.06	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	7.64	Higher	2.50	Moderate	6.33	2.50
Pollinator Habitat (POL)	8.09	Higher	0.00	Lower	6.70	0.00
Native Plant Habitat (PH)	2.61	Lower	5.00	Moderate	4.53	4.34
Public Use & Recognition (PU)			1.81	Lower		1.62
Wetland Sensitivity (Sens)			5.13	Moderate		3.82
Wetland Ecological Condition (EC)			7.24	Higher		8.33
Wetland Stressors (STR) (higher score means more stress)			4.45	Moderate		3.28
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	7.07	Higher	1.17	Lower	7.14	1.90
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	10.00	Higher	9.40	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	1.01	Lower	1.96	Lower	2.83	2.03
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	2.59	Lower	4.56	Moderate	3.62	3.07
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	6.70	Moderate	3.39	Lower	6.27	3.31
WETLAND CONDITION (EC)			7.24	Higher		8.33
WETLAND RISK (average of Sensitivity & Stressors)			4.67	Moderate		3.55

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 15 Boat Harbour
Investigator Name:	Christina Laflemme, Brady Leights
Date of Field Assessment:	29/09/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.661986
Longitude (decimal degrees):	-62.664665
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~1.2
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	29-Sep-17	Site Identifier: WL-15	Investigator: CL, BL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 1 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAV, FRv, NRV, PH, PU, SBM, WBFV]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAV, FRv, NRV, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
		>500 m	1	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0=no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Ponded Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Pondered Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
		>40 km	0	
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.012	[NR, Sens, SFSv, WCV, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	1	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	0	
		>25%	1	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	1	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
		>2 km, or wetland lacks an inlet and/or outlet.	0	
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]:</i>		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]:</i>		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species).	0	
		none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area - but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotecteddeareas/plan/interactive-map/">https://novascotia.ca/parksandprotecteddeareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: September 29, 2017		Site Identifier: WL-15		Investigator: C. LaFlamme, B. Leights	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>0</p> <p>1</p> <p>0</p> <p>2</p> <p>1</p> <p>2</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/ hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is: Few or none that meet these criteria. Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0 1	Exclude temporary "burn piles." [AM, INV, POL, SBM]
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: <1% or none 1-25% of the vegetated cover, in the AA or along its water edge (whichever has more). 25-50% of the vegetated cover, in the AA or along its water edge (whichever has more). 50-75% of the vegetated cover, in the AA or along its water edge (whichever has more). >75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0 1 0 0 0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: <5% of the vegetated part of the AA. 5-25% of the vegetated part of the AA. 25-50% of the vegetated part of the AA. 50-95% of the vegetated part of the AA. >95% of the vegetated part of the AA.	0 1 0 0 0	Exclude moss growing on trees and rocks. [CS, PH]
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is: Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage. Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA. Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA. Other conditions. Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	1 0 0 0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is: Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered). Intermediate. Several (extensive micro-topography).	1 0 0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
F13	Upland Inclusions	Within the AA, inclusions of upland are: Few or none. Intermediate (1 - 10% of vegetated part of the AA). Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	1 0 0	[AM, NR, SBM]
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)] Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger. Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger. Peat, to 40 cm depth or greater. Peat or organic <40 cm deep. Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0 1 0 0 0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA]. none, or <100 sq. m. 100-1000 sq. m. 1000 - 10,000 sq. m. >10,000 sq. m.	1 0 0 0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is: <5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover). 5-25% of the vegetated part of the AA. 25-50% of the vegetated part of the AA. 50-95% of the vegetated part of the AA. >95% of the vegetated part of the AA.	0 1 0 0 0	[AM, WBF, WBN]
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of: <5% of the herbaceous part of the AA. 5-25% of the herbaceous part of the AA. 25-50% of the herbaceous part of the AA. 50-95% of the herbaceous part of the AA. >95% of the herbaceous part of the AA.	1 0 0 0 0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
F18	Sedge Cover	Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy: <5% of the vegetated area, or none. 5-50% of the vegetated area. 50-95% of the vegetated area. >95% of the vegetated area.	1 0 0 0	[CS]
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year. those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1 0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals). invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody). invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody). invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody). invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	1 0 0 0 0	[EC, PH, POL, Sens]
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species: none of the upland edge (invasives apparently absent), or AA has no upland edge. some (but <5%) of the upland edge. 5-50% of the upland edge. most (>50%) of the upland edge.	1 0 0 0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	1		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualizing where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	1		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	1		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	1		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
		100% of the ponded water.	1		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	1		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
		>100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	1		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	1		
		>75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	1		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	1		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	1		
		Extensive.	1		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a waterbird nest.	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 OutNone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	1		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement)	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.				
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0	
		5 to 30%	0	
		30 to 60%	0	
		60 to 90%	1	
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0	
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):		[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	1	
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0	
		2-5%	1	
		5-30%	0	
		>30%	0	
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0	
		yes, and created or expanded 20 - 100 years ago.	0	
		yes, and created or expanded 3-20 years ago.	0	
		yes, and created or expanded within last 3 years.	0	
		yes, but time of origin or expansion unknown.	0	
		unknown if new or expanded within 20 years or not.	1	
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0	
		burned 6-10 years ago.	0	
		burned 11-30 years ago.	1	
		burned >30 years ago, or no evidence of a burn and no data.	0	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]
		<25%	1	
		25-50%	0	
		>50%	0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1	
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	1	
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: <i>[Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]</i>		[AM, Fav, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0	
		<5% and inhabited building is within 100 m of the AA.	0	
		5-50% and no inhabited building is within 100 m of the AA.	0	
		5-50% and inhabited building is within 100 m of the AA.	0	
		50-95%, with or without inhabited building nearby.	0	
		>95% of the AA with or without inhabited building nearby.	1	
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i>		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1	
		5-50%	0	
		50-95%	0	
		>95% of the AA	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[Fav, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
		none of the above.	0	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0	[PH, PR]

BuffAINat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1		<b>Aberrant Timing of Water Inputs</b>			
<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>					
stormwater from impervious surfaces that drains directly to the wetland					
water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation					
regular removal of surface or groundwater for irrigation or other consumptive use					
flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland					
a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)					
excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch					
artificial drains or ditches in or near the wetland					
accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)					
logging within the wetland					
subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles					
straightening, ditching, dredging, and/or lining of tributary channels					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of timing shift within the wetland		>95% of wetland	5-95% of wetland	<5% of wetland	0
When most of the timing shift began		<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					
Input timing now vs. previously		shift of weeks	shift of days	shift of hours or minutes	0
Flashiness or muting		became very flashy or controlled	intermediate	became mildly flashy or controlled	0
				Sum=	0
				Final Score=	0.00

S2		<b>Accelerated Inputs of Contaminants and/or Salts</b>			
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities					
metals & chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;nav=B85A1846-1</a> )					
road salt					
spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Usual toxicity of most toxic contaminants		industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	3
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	1
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	2
				Sum=	6
				Final Score=	0.67

S3		<b>Accelerated Inputs of Nutrients</b>			
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills					
fertilizers applied to lawns, ag lands, or other areas in the CA					
livestock, dogs					
artificial drainage of upslope lands					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Type of loading		high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	0
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
				Sum=	0
				Final Score=	0.00

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				0
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				0
				Final Score=
				0.00

Wetland ID:	WL-15
Date:	9/29/17
Observer:	CL, BL
Latitude & Longitude (decimal degrees):	45.661986 Lat, -62.664665 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	3.51	Moderate	1.85	Lower	4.30	2.53
Stream Flow Support (SFS)	2.03	Lower	2.47	Moderate	1.08	1.83
Water Cooling (WC)	1.33	Lower	0.00	Lower	0.89	0.00
Sediment Retention & Stabilisation (SR)	2.87	Moderate	10.00	Higher	4.96	10.00
Phosphorus Retention (PR)	1.20	Lower	10.00	Higher	4.56	10.00
Nitrate Removal & Retention (NR)	3.61	Moderate	1.88	Lower	5.26	4.58
Carbon Sequestration (CS)	4.74	Moderate			6.53	
Organic Nutrient Export (OE)	4.68	Moderate			3.71	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	8.16	Higher	2.67	Moderate	5.15	1.89
Aquatic Invertebrate Habitat (INV)	5.36	Moderate	8.23	Higher	5.44	5.68
Amphibian & Turtle Habitat (AM)	9.53	Higher	4.83	Moderate	8.45	4.61
Waterbird Feeding Habitat (WBF)	9.31	Higher	4.17	Moderate	7.46	4.17
Waterbird Nesting Habitat (WBN)	8.05	Higher	0.00	Lower	6.66	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	7.68	Higher	0.00	Lower	6.35	0.00
Pollinator Habitat (POL)	7.19	Moderate	0.00	Lower	5.96	0.00
Native Plant Habitat (PH)	3.98	Moderate	4.73	Moderate	5.10	4.10
Public Use & Recognition (PU)			3.38	Moderate		2.73
Wetland Sensitivity (Sens)			4.19	Moderate		3.51
Wetland Ecological Condition (EC)			4.48	Moderate		6.67
Wetland Stressors (STR) (higher score means more stress)			4.72	Moderate		3.40
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	3.51	Moderate	1.85	Lower	4.30	2.53
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	3.02	Lower	9.84	Higher	5.93	9.10
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	4.02	Moderate	5.64	Moderate	4.11	4.09
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	9.35	Higher	5.14	Moderate	6.99	3.37
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	6.32	Moderate	2.80	Lower	6.08	2.74
WETLAND CONDITION (EC)			4.48	Moderate		6.67
WETLAND RISK (average of Sensitivity & Stressors)			4.23	Moderate		3.46

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	WL-16
Investigator Name:	Christina Laflemme
Date of Field Assessment:	07/09/2017
Nearest Town:	Pictou Landing
Latitude (decimal degrees):	45.663327
Longitude (decimal degrees):	-62.664649
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~30
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	no
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	Former settling pond for water treatment facility, currently regaining natural-looking form

Date:	07-Sep-17	Site Identifier: WL-16	Investigator: CL, BL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one.		This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
		New Brunswick	0	
		Nova Scotia	1	
		Prince Edward Island	0	
		Newfoundland-Labrador	0	
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is:		"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
		<0.01 hectare (about 10 m x 10 m)	0	
		0.01 - 0.1 hectare	0	
		0.1 - 1 hectare	0	
		1 to 10 hectares	0	
		10 to 100 hectares	1	
		>100 hectares	0	
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is:		See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
		<0.01 hectare (about 10 m x 10 m)	0	
		0.01 - 0.1 hectare	0	
		0.1 - 1 hectare	0	
		1 to 10 hectares	0	
		10 to 100 hectares	1	
		>100 hectares	0	
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is:		See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
		<0.01 hectare (about 10 m x 10 m)	0	
		0.01 - 0.1 hectare	0	
		0.1 - 1 hectare	0	
		1 to 10 hectares	0	
		10 to 100 hectares	1	
		100 to 1000 hectares	0	
>1000 hectares [ <i>This is nearly always the answer in relatively undeveloped landscapes.</i> ]	0			
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is:		To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
		<50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes].	0	
		<50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation.	0	
		50-500 m, and <b>not</b> separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 5 km, and <b>not</b> separated.	0	
		0.5 - 5 km, but separated by those features.	0	
none of the above (the closest patches or corridors which are that large are >5 km away).	0			
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	2	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is:		In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]
		<5% of the land.	0	
		5 to 20% of the land.	0	
		20 to 60% of the land.	0	
		60 to 90% of the land.	1	
		>90% of the land. SKIP to OF10.	0	

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	0	
>5 km	1			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
>500 m	1			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	1	
		1 - 5 km	0	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1			
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.126	[NR, Sens, SFSv, WCv, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1			

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	1	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	1	
		1- 2 km	0	
		>2 km, or wetland lacks an inlet and/or outlet.	0	
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]:</i>		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]:</i>		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SuppInfo file, during their nesting season (May-July for most species).	0	
		none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAS_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: September 8, 2017		Site Identifier: WL-16		Investigator: Christina LaFlamme, Brady Leights	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt;50% of such cover.</p> <p>those species together do not comprise &gt;50% of such cover.</p>	<p>1</p> <p>0</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	0	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	1	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of <b>Sphagnum</b> moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	1	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	
		Intermediate.	0	
		Several (extensive micro-topography).	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are:		[AM, NR, SBM]
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
F14	Soil Texture	Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
F15	Shorebird Feeding Habitats	Peat or organic <40 cm deep.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	1000 - 10,000 sq. m.	0	[AM, WBF, WBN]
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
F17	Forb Cover	25-50% of the vegetated part of the AA.	1	[AM, WBF, WBN]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
F18	Sedge Cover	5-25% of the herbaceous part of the AA.	1	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	0	
		>95% of the herbaceous part of the AA.	0	
		Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		
F19	Dominance of Most Abundant Herbaceous Species	<5% of the vegetated area, or none.	0	[CS]
		5-50% of the vegetated area.	1	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
F20	Invasive Plant Cover	those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	[EC, PH, POL, Sens]
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
F22	Fringe Wetland	some (but <5% of the upland edge).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
		During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	
		[WBF, WBN, WCV.]		
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	1		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation is most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	1		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	1		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	1		
		70-99% of the ponded water.	0		
		100% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	1		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	1		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	1		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	1		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	1		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	1		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement).	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	1		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g. Labrador tea) are prevalent. Enter "1".	1		
		neither of above. Enter "1".	0		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	1		
		neither of above.	0		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS.]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		
Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.					
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]	
		<5%	0		
		5 to 30%	0		
		30 to 60%	0		
		60 to 90%	0		

		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1	
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): Impervious surface, e.g., paved road, parking lot, building, exposed rock. bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0 1	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of: <1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands. 2-5% 5-30% >30%	0 1 0 0	[NRv, PRv, Sens, SRv]
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): No. yes, and created or expanded 20 - 100 years ago. yes, and created or expanded 3-20 years ago. yes, and created or expanded within last 3 years. yes, but time of origin or expansion unknown. unknown if new or expanded within 20 years or not.	0 0 0 0 0 1	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
F57	Burn History	More than 1% of the AA's previously vegetated area: burned within past 5 years. burned 6-10 years ago. burned 11-30 years ago. burned >30 years ago, or no evidence of a burn and no data.	0 0 0 1	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is: <25% 25-50% >50%	1 0 0	[PU, STR, WBFv]
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists: For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets. Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters. Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	1 0 0	[PU, STR]
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail] <5% and no inhabited building is within 100 m of the AA. <5% and inhabited building is within 100 m of the AA. 5-50% and no inhabited building is within 100 m of the AA. 5-50% and inhabited building is within 100 m of the AA. 50-95%, with or without inhabited building nearby. >95% of the AA with or without inhabited building nearby.	0 0 0 0 0 1	[AM, Fav, FRv, PH, PU, SBM, STR, WBF, WBN]
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]. <5%. If F61 was answered ">95%" (mostly never visited). SKIP to F65. 5-50% 50-95% >95% of the AA.	0 0 0 0	[AM, PH, PU, SBM, STR, WBF, WBN]
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorized boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. low-impact commercial timber harvest (e.g., selective thinning). commercial or traditional-use harvesting of native plants, their fruits, or mushrooms. waterfowl hunting. fishing. trapping of furbearers. none of the above.	0 0 0 0 0 0	[Fav, FRv, WBFv]
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are: Within 0-100 m of the AA. 100-500 m away. >500 m away, or no information.	0 0 1	[NRv]
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Suppinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0	[PH, PR]

BuffAllNat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1	<p><b>Aberrant Timing of Water Inputs</b></p> <p><i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i></p> <p>stormwater from impervious surfaces that drains directly to the wetland</p> <p>water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation</p> <p>regular removal of surface or groundwater for irrigation or other consumptive use</p> <p>flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland</p> <p>a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)</p> <p>excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch</p> <p>artificial drains or ditches in or near the wetland</p> <p>accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)</p> <p>logging within the wetland</p> <p>subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles</p> <p>straightening, ditching, dredging, and/or lining of tributary channels</p> <p style="text-align: right;">1</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Spatial extent of timing shift within the wetland</td> <td style="text-align: center;">&gt;95% of wetland</td> <td style="text-align: center;">5-95% of wetland</td> <td style="text-align: center;">&lt;5% of wetland</td> <td style="text-align: center;">1</td> </tr> <tr> <td>When most of the timing shift began</td> <td style="text-align: center;">&lt;3 yrs ago</td> <td style="text-align: center;">3-9 yrs ago</td> <td style="text-align: center;">10-100 yrs ago</td> <td style="text-align: center;">1</td> </tr> <tr> <td colspan="5"><i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i></td> </tr> <tr> <td>Input timing now vs. previously</td> <td style="text-align: center;">shift of weeks</td> <td style="text-align: center;">shift of days</td> <td style="text-align: center;">shift of hours or minutes</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Flashiness or muting</td> <td style="text-align: center;">became very flashy or controlled</td> <td style="text-align: center;">intermediate</td> <td style="text-align: center;">became mildly flashy or controlled</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>2</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.17</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	1	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	1	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0	<b>Sum=</b>				<b>2</b>	<b>Final Score=</b>				<b>0.17</b>
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S2	<p><b>Accelerated Inputs of Contaminants and/or Salts</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities</p> <p style="text-align: right;">1</p> <p>metals &amp; chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;nav=B85A1846-1</a>)</p> <p style="text-align: right;">1</p> <p>road salt</p> <p>spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Usual toxicity of most toxic contaminants</td> <td style="text-align: center;">industrial effluent, mining waste, unmanaged landfill</td> <td style="text-align: center;">cropland, managed landfill, pipeline or transmission rights-of-way</td> <td style="text-align: center;">low density residential</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td style="text-align: center;">frequent and year-round</td> <td style="text-align: center;">frequent but mostly seasonal</td> <td style="text-align: center;">infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">3</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td style="text-align: center;">0 - 15 m</td> <td style="text-align: center;">15-100 m or in groundwater</td> <td style="text-align: center;">in more distant part of contributing area</td> <td style="text-align: center;">3</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>9</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>1.00</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	3	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3	<b>Sum=</b>				<b>9</b>	<b>Final Score=</b>				<b>1.00</b>
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<b>Final Score=</b>				<b>1.00</b>																											

S3	<p><b>Accelerated Inputs of Nutrients</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills</p> <p style="text-align: right;">1</p> <p>fertilizers applied to lawns, ag lands, or other areas in the CA</p> <p>livestock, dogs</p> <p>artificial drainage of upslope lands</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Type of loading</td> <td style="text-align: center;">high density of unmaintained septic, some types of industrial sources</td> <td style="text-align: center;">moderate density septic, cropland, secondary wastewater treatment plant</td> <td style="text-align: center;">livestock, pets, low density residential</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td style="text-align: center;">frequent and year-round</td> <td style="text-align: center;">frequent but mostly seasonal</td> <td style="text-align: center;">infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">3</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td style="text-align: center;">0 - 15 m</td> <td style="text-align: center;">15-100 m or in groundwater</td> <td style="text-align: center;">in more distant part of contributing area</td> <td style="text-align: center;">3</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>9</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>1.00</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	3	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	3	<b>Sum=</b>				<b>9</b>	<b>Final Score=</b>				<b>1.00</b>
	Severe (3 points)	Medium (2 points)	Mild (1 point)																												
Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	3																											
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<b>Sum=</b>				<b>9</b>																											
<b>Final Score=</b>				<b>1.00</b>																											

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	3
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	1
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	3
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.83
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-16
Date:	9/7/17
Observer:	CL, BL
Latitude & Longitude (decimal degrees):	45.663327 Lat, -62.664649 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	1.30	Lower	0.00	Lower	2.54	0.32
Stream Flow Support (SFS)	3.02	Moderate	3.68	Moderate	1.61	2.71
Water Cooling (WC)	2.33	Moderate	3.76	Moderate	1.56	2.43
Sediment Retention & Stabilisation (SR)	3.58	Moderate	10.00	Higher	5.46	10.00
Phosphorus Retention (PR)	2.63	Moderate	10.00	Higher	5.45	10.00
Nitrate Removal & Retention (NR)	2.25	Lower	10.00	Higher	4.84	10.00
Carbon Sequestration (CS)	5.51	Moderate			6.87	
Organic Nutrient Export (OE)	5.44	Moderate			4.32	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	8.10	Higher	2.09	Moderate	5.11	1.48
Aquatic Invertebrate Habitat (INV)	9.96	Higher	8.56	Higher	7.40	5.85
Amphibian & Turtle Habitat (AM)	9.92	Higher	8.11	Higher	8.64	6.82
Waterbird Feeding Habitat (WBF)	9.26	Higher	6.67	Moderate	7.42	6.67
Waterbird Nesting Habitat (WBN)	9.16	Higher	6.67	Moderate	7.58	6.67
Songbird, Raptor, & Mammal Habitat (SBM)	7.70	Higher	6.67	Moderate	6.38	6.67
Pollinator Habitat (POL)	6.27	Moderate	6.67	Moderate	5.19	6.67
Native Plant Habitat (PH)	7.01	Higher	7.01	Higher	6.35	6.08
Public Use & Recognition (PU)			0.75	Lower		0.87
Wetland Sensitivity (Sens)			2.41	Lower		2.95
Wetland Ecological Condition (EC)			4.48	Moderate		6.67
Wetland Stressors (STR) (higher score means more stress)			6.73	Higher		4.26
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	1.30	Lower	0.00	Lower	2.54	0.32
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	3.90	Moderate	10.00	Higher	6.26	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	7.42	Higher	6.84	Moderate	5.56	4.76
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	9.75	Higher	9.50	Higher	7.20	5.57
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	6.51	Moderate	6.72	Moderate	6.17	6.57
WETLAND CONDITION (EC)			4.48	Moderate		6.67
WETLAND RISK (average of Sensitivity & Stressors)			4.92	Moderate		3.60

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 17, Boat Harbour
Investigator Name:	Christina LaFlamme, Brady Leights
Date of Field Assessment:	08/09/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.665698
Longitude (decimal degrees):	-62.664772
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	~2.56
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

#	Indicators	Condition Choices	Data	Definitions/Explanations
<p>Date: September 8th, 2017   Site Identifier: Wetland 5   Investigator: Christina LaFlamme and Brady Leights</p> <p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:            Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>            GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>            For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 1 0 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 1 0 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [ <i>This is nearly always the answer in relatively undeveloped landscapes.</i> ]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the <b>edge</b> of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	1 0 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation" ]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1" [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. <b>SKIP to OF10.</b>	0 0 0 0 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured <b>along</b> the maintained road nearest the AA, the distance to the nearest <b>population center</b> is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool- Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the <b>center</b> of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler-Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
>500 m	1			
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is <b>larger than 8 hectares</b> is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	1	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest <b>tidal water body</b> (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do <b>not</b> show Flood Zone or Flood Risk areas (or <b>no such mapping has been done locally</b> ) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is <b>no infrastructure</b> vulnerable to river flooding unrelated to tidal storm surges.	1	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.14	[NR, Sens, SFSv, WCV, WSv]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of <b>metals, hydrocarbons, nutrients</b> , or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow <b>into</b> the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope from the AA</b> , and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	1	
		Mostly untrue	0	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry->WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	1	
		50 - 100 m	0	
		100 - 1000 m	0	
		1 - 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1			
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species).	0	
none of the above, or no data.	1			
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .	0	[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.	0	[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		"Private lands" may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: September 8th, 2017		Site Identifier: Wetland 17		Investigator: Christina LaFlamme and Brady Leights	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>3</p> <p>4</p> <p>1</p> <p>2</p> <p>2</p> <p>2</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>1</p> <p>0</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
F9	N Fixers	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	Exclude moss growing on trees and rocks. [CS, PH]
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	1	
F11	% Bare Ground & Thatch	25-50% of the vegetated part of the AA.	0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
F12	Ground Irregularity	Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
F13	Upland Inclusions	Intermediate.	1	[AM, NR, SBM]
		Several (extensive micro-topography).	0	
		Within the AA, inclusions of upland are:		
F14	Soil Texture	Few or none.	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Intermediate (1 - 10% of vegetated part of the AA).	1	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
F15	Shorebird Feeding Habitats	Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
F16	Herbaceous % of Vegetated Wetland	none, or <100 sq. m.	1	[AM, WBF, WBN]
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
F17	Forb Cover	<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	[AM, WBF, WBN]
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
F18	Sedge Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	1	
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	0	
F19	Dominance of Most Abundant Herbaceous Species	>95% of the herbaceous part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
F20	Invasive Plant Cover	those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	[EC, PH, POL, Sens]
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
F22	Fringe Wetland	some (but <5% of the upland edge).	0	[WBF, WBN, WCV.]
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F23	Lacustrine Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[WBF, WBN, WCV.]
		The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		NoPersis
		1-20% of the AA.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	1		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		NoSeasonal
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation is most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	1		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) <b>ponded</b> (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		NoPonded
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	1		
		>95% of the water.	0		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of <b>open water</b> that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	<b>Open water</b> is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is <b>open</b> (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	1		NoOpenPonded
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		NoOpenPonded1
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
		100% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is <b>nearly flat</b> (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/ei/DC/catalogue-E.asp">http://w.snb.ca/geonb1/ei/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	1		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH measurement)	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NR, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above.	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS.]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSleep
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	0
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	0
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0 Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	1
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	0
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: <i>[Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]</i>	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i>	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0 [PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0 [AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0 [PH, PR]

BuffAllNat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1		<b>Aberrant Timing of Water Inputs</b>			
		<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>			
		stormwater from impervious surfaces that drains directly to the wetland			
		water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation			
		regular removal of surface or groundwater for irrigation or other consumptive use			
		flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland			
		a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)			
		excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch			
		artificial drains or ditches in or near the wetland			
		accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)			
		logging within the wetland			
		subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles			
		straightening, ditching, dredging, and/or lining of tributary channels			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
	Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	0
	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>				
	Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0
	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0
				Sum=	0
				Final Score=	0.00

S2		<b>Accelerated Inputs of Contaminants and/or Salts</b>			
		<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>			
		stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities			
		metals & chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/nrp-npri/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/nrp-npri/default.asp?lang=En&amp;nav=B85A1846-1</a> )			
		road salt			
		spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	0
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
				Sum=	0
				Final Score=	0.00

S3		<b>Accelerated Inputs of Nutrients</b>			
		<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>			
		stormwater or wastewater effluent (including failing septic systems), landfills			
		fertilizers applied to lawns, ag lands, or other areas in the CA			
		livestock, dogs			
		artificial drainage of upslope lands			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
	Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	0
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
				Sum=	0
				Final Score=	0.00

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	Wetland-17
Date:	September 8th, 2017
Observer:	Christina LaFlamme and Brady Leights
Latitude & Longitude (decimal degrees):	45.665598; -62.664772

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	2.96	Moderate	0.84	Lower	3.87	1.60
Stream Flow Support (SFS)	2.97	Moderate	2.17	Moderate	1.58	1.60
Water Cooling (WC)	6.54	Higher	0.73	Lower	4.36	0.47
Sediment Retention & Stabilisation (SR)	3.17	Moderate	10.00	Higher	5.18	10.00
Phosphorus Retention (PR)	0.99	Lower	10.00	Higher	4.43	10.00
Nitrate Removal & Retention (NR)	5.10	Moderate	10.00	Higher	5.72	10.00
Carbon Sequestration (CS)	6.31	Higher			7.23	
Organic Nutrient Export (OE)	5.78	Moderate			4.59	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	5.31	Moderate	4.54	Moderate	5.42	3.76
Amphibian & Turtle Habitat (AM)	7.15	Higher	5.25	Moderate	7.23	4.88
Waterbird Feeding Habitat (WBF)	5.90	Moderate	2.50	Moderate	4.73	2.50
Waterbird Nesting Habitat (WBN)	3.87	Moderate	2.50	Moderate	3.20	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	8.97	Higher	2.50	Moderate	7.42	2.50
Pollinator Habitat (POL)	7.93	Higher	0.00	Lower	6.56	0.00
Native Plant Habitat (PH)	3.14	Lower	5.38	Moderate	4.75	4.66
Public Use & Recognition (PU)			1.81	Lower		1.62
Wetland Sensitivity (Sens)			4.38	Moderate		3.58
Wetland Ecological Condition (EC)			4.94	Moderate		6.94
Wetland Stressors (STR) (higher score means more stress)			2.18	Lower		2.31
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	2.96	Moderate	0.84	Lower	3.87	1.60
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	4.34	Moderate	10.00	Higher	6.44	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	5.41	Moderate	3.43	Moderate	4.70	2.85
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	5.61	Moderate	5.26	Moderate	5.13	3.43
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	7.82	Higher	3.60	Lower	6.83	3.53
WETLAND CONDITION (EC)			4.94	Moderate		6.94
WETLAND RISK (average of Sensitivity & Stressors)			1.79	Lower		2.94

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 18a,b,c, Boat Harbour
Investigator Name:	Christina Laflemme, Brady Leights
Date of Field Assessment:	23/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.670935
Longitude (decimal degrees):	-62.658130
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	3.31
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	23-Aug-17	Site Identifier: Wetland 18a,b,c	Investigator: CL, BL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 0 1 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMV, PhV, POLV, SBMV, WBFV, WBNV]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMV, PhV, POLV, SBMV]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP TO OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool-> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[Fav, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	1	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	0	
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler->Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	1	
		50 - 100 m	0	
		100 - 500 m	0	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	1	
		1 - 5 km	0	
		5-10 km	0	
		10-40 km	0	
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	1	
OF17	Flood Damage from Non-tidal Waters	More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	0	In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Within 5 km downstream or downslope of the AA (select first true choice):		
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
OF18	Relative Elevation in Watershed	Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		0.048		
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope from the AA</b> , and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	1	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry>WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	1	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas.Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area - but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: Aug 23, 2017		Site Identifier: WL 18a,b,c		Investigator: CL, BL	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>0</p> <p>5</p> <p>0</p> <p>2</p> <p>0</p> <p>2</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/ hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
F9	N Fixers	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	Exclude moss growing on trees and rocks. [CS, PH]
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		
		<5% of the vegetated part of the AA.	1	
		5-25% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	25-50% of the vegetated part of the AA.	0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	1	
F12	Ground Irregularity	Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
		Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		
F13	Upland Inclusions	Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	[AM, NR, SBM]
		Intermediate.	0	
		Several (extensive micro-topography).	0	
F14	Soil Texture	Within the AA, inclusions of upland are:		[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
F15	Shorebird Feeding Habitats	Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F16	Herbaceous % of Vegetated Wetland	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		[AM, WBF, WBN]
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
F17	Forb Cover	In aerial ("duck's eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
F18	Sedge Cover	>95% of the vegetated part of the AA.	0	[CS]
		Sedges ( <i>Carex</i> spp.) and cottongrass ( <i>Eriophorum</i> spp.) occupy:		
		<5% of the vegetated area, or none.	1	
		5-50% of the vegetated area.	0	
F19	Dominance of Most Abundant Herbaceous Species	50-95% of the vegetated area.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		>95% of the vegetated area.	0	
F20	Invasive Plant Cover	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		[EC, PH, POL, Sens]
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplnfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
F21	Invasive Cover Along Upland Edge	invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
F22	Fringe Wetland	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		[WBF, WBN, WCV, ]
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
		some (but <5% of the upland edge).	0	
		5-50% of the upland edge.	0	
F23	Lacustrine Wetland	most (>50%) of the upland edge.	0	[FR, PR, PU, WBF, WBN]
		The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	1	

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	1		AllSat2
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	1		NoPersis
		1-20% of the AA.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	1		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualizing where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		NoSeasonal
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	1		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation is most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	1		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		NoPonded
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	1		NoOpenPonded
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		NoOpenPonded1
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
		100% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	1		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	1		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	1		
		25-75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
F38	Persistent Deepwater Area	Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	1		DeepPersis
		If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	1		
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	1		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/ed/DC/catalogue-E.asp">http://w.snb.ca/geonb1/ed/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement)	1		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS.]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	1		
F51	Internal Gradient	Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	0		TooSteep
		The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	
		<2% or the AA has no surface water outlet (not even seasonally)	0		
		2-5%	1		
		6-10%	0		
>10%	0				

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	1
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	1
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	0
		5-30%	1
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0
		Do not include upturned trees as potential den sites. [POL, SBM]	
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	1
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: <i>[Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]</i>	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	1
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	0
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i>	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SuppInfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	[PH, PR]

BuffAIINat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1		<b>Aberrant Timing of Water Inputs</b>			
		<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>			
		stormwater from impervious surfaces that drains directly to the wetland			
		water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation			
		regular removal of surface or groundwater for irrigation or other consumptive use			
		flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland			
		a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)			
		excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch			
		artificial drains or ditches in or near the wetland			
		accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)			
		logging within the wetland			
		subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles			
		straightening, ditching, dredging, and/or lining of tributary channels			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
		Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland
		When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago
		<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>			
		Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes
		Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled
				Sum=	0
				Final Score=	0.00

S2		<b>Accelerated Inputs of Contaminants and/or Salts</b>			
		<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>			
		stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities		1	
		metals & chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;nav=B85A1846-1</a> )			
		road salt			
		spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
		Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential
		Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly
		AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area
				Sum=	8
				Final Score=	0.89

S3		<b>Accelerated Inputs of Nutrients</b>			
		<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>			
		stormwater or wastewater effluent (including failing septic systems), landfills		1	
		fertilizers applied to lawns, ag lands, or other areas in the CA			
		livestock, dogs			
		artificial drainage of upslope lands			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
		Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential
		Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly
		AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area
				Sum=	8
				Final Score=	0.89

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				0
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				0
				Final Score=
				0.00

Wetland ID:	WL-18a,b,c
Date:	8/23/17
Observer:	CL, BL
Latitude & Longitude (decimal degrees):	45.670935 Lat, -62.658130 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	7.65	Higher	0.00	Lower	7.60	0.12
Stream Flow Support (SFS)	1.63	Lower	0.00	Lower	0.87	0.00
Water Cooling (WC)	8.00	Higher	0.00	Lower	5.33	0.00
Sediment Retention & Stabilisation (SR)	4.62	Moderate	10.00	Higher	6.20	10.00
Phosphorus Retention (PR)	2.92	Moderate	10.00	Higher	5.62	10.00
Nitrate Removal & Retention (NR)	10.00	Higher	8.33	Higher	10.00	8.89
Carbon Sequestration (CS)	2.71	Lower			5.61	
Organic Nutrient Export (OE)	4.26	Moderate			3.38	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	5.15	Moderate	8.63	Higher	3.25	6.12
Aquatic Invertebrate Habitat (INV)	4.38	Moderate	4.85	Moderate	5.02	3.93
Amphibian & Turtle Habitat (AM)	4.49	Moderate	3.54	Moderate	5.87	3.73
Waterbird Feeding Habitat (WBF)	5.71	Moderate	3.33	Moderate	4.58	3.33
Waterbird Nesting Habitat (WBN)	3.94	Moderate	0.00	Lower	3.26	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	7.99	Higher	0.00	Lower	6.61	0.00
Pollinator Habitat (POL)	7.90	Higher	0.00	Lower	6.54	0.00
Native Plant Habitat (PH)	4.70	Moderate	5.05	Moderate	5.40	4.38
Public Use & Recognition (PU)			3.25	Moderate		2.64
Wetland Sensitivity (Sens)			8.14	Higher		4.78
Wetland Ecological Condition (EC)			3.56	Moderate		6.11
Wetland Stressors (STR) (higher score means more stress)			5.77	Higher		3.85
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	7.65	Higher	0.00	Lower	7.60	0.12
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	9.56	Higher	10.00	Higher	8.43	9.81
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	4.91	Moderate	3.01	Moderate	4.49	2.62
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	4.61	Moderate	7.13	Higher	4.63	4.38
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	6.95	Moderate	2.99	Lower	6.40	2.92
WETLAND CONDITION (EC)			3.56	Moderate		6.11
WETLAND RISK (average of Sensitivity & Stressors)			8.30	Higher		4.31

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 19, Boat Harbour
Investigator Name:	Marina Dulmage, Deborah Bear
Date of Field Assessment:	14/08/2017
Nearest Town:	Pictou Landing, N.S.
Latitude (decimal degrees):	45.668695
Longitude (decimal degrees):	-62.652834
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	0.60
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	14-Aug-17	Site Identifier: WL-19	Investigator: MD, DB	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 1 0 0 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [* NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 1 0 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAV, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	1	
		0.5 - 1 km	0	
		1 - 5 km	0	
		>5 km	0	
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAV, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	1	
		>500 m	0	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
		>40 km	0	
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	0	
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.011	[NR, Sens, SFSv, WCv, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope from the AA</b> , and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	1	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	1	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	1			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEL_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species), none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 14, 2017		Site Identifier: WL-19		Investigator: MD, DB	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>3</p> <p>3</p> <p>3</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>1</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
F9	N Fixers	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		
		<1% or none	1	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	Exclude moss growing on trees and rocks. [CS, PH]
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	25-50% of the vegetated part of the AA.	1	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
F12	Ground Irregularity	Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	1	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
		Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		
F13	Upland Inclusions	Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	[AM, NR, SBM]
		Intermediate.	0	
		Several (extensive micro-topography).	0	
F14	Soil Texture	Within the AA, inclusions of upland are:		[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
F15	Shorebird Feeding Habitats	Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F16	Herbaceous % of Vegetated Wetland	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		[AM, WBF, WBN]
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
F17	Forb Cover	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		[AM, WBF, WBN]
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	1	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
F18	Sedge Cover	>95% of the vegetated part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	0	
F19	Dominance of Most Abundant Herbaceous Species	50-95% of the herbaceous part of the AA.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		>95% of the herbaceous part of the AA.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
F20	Invasive Plant Cover	those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	[EC, PH, POL, Sens]
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
F22	Fringe Wetland	some (but <5%) of the upland edge.	0	[WBF, WBN, WCV, ]
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F23	Lacustrine Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[FR, PR, PU, WBF, WBN]
		The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	AllSat2 AllSat1
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0				
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis  AllWet
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
>95% of the AA. True for many fringe wetlands.	0				
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	NoSeasonal
		<5% of the water is shaded, or no surface water is present then.	1		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	TooSmall
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
>95% of the AA.	0				
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	TooSmall
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
>2 m change.	0				
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	NoPonded
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
>2 m deep. True for many fringe wetlands.	0				
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	OpenW
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
Neither of above. There are 3 or more depth classes and none occupy >50%.	0				
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoOpenPonded NoOpenPonded1
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
>95% of the water.	0				
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	AllOpenPond
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	AllOpenPond
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
100% of the ponded water.	0				
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	NoRobusEm
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
> 100 m, or open water is absent at that time.	0				
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	NoRobusEm
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
>75% of the water edge.	0				
F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobusEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75%, of the emergent vegetation.	0		

F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly: Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water. Intermediate. Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0 0 0	[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		DeepPersist
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is: Little or none. Intermediate. Extensive.	0 0 0	For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.] persistent (surface water flows out for >9 months/year). seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive). temporary (surface water flows out for <14 days, not necessarily consecutive). none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH measurement) no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0 0 0 0 0 1	Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 OutNone
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water: mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features. is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0 0 0	"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water]. Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. bumps into herbaceous vegetation but mostly remains in fairly straight channels. bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0 0 0 0 0	[FA, FR, INV, NR, OE, PR, SR, WS]	
F47	pH Measurement	The pH in most of the AA's surface water: was measured, and is: [enter the reading in the column to the right]: was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1". neither of above. Enter "1".	0 1 1	Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information): TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]: Conductivity is: [enter the reading in µS/cm in the column to the right]: was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1". neither of above.	0 0 0 1	See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE): evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0 0 1	[FA, FR, PH, SBM, Sens, WBF, WBN]	
F50	Groundwater Strength of Evidence	Select first applicable choice: Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5. Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	0 0 1	Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
F51	Internal Gradient	The gradient along most of the flow path within the AA is: <2% or the AA has no surface water outlet (not even seasonally) 2-5% 6-10% >10%	1 0 0 0	This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	1
		5 to 30%	0
		30 to 60%	0
		60 to 90%	0
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	1
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no).	0 Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	1
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	0
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	1
		>95% of the AA with or without inhabited building nearby.	0
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0 [PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0 [AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	1
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SupplInfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0 [PH, PR]

BuffAllNat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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<b>S1</b>		<b>Aberrant Timing of Water Inputs</b>			
<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>					
stormwater from impervious surfaces that drains directly to the wetland					
water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation					
regular removal of surface or groundwater for irrigation or other consumptive use					
flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland					
a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)					
excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch					
artificial drains or ditches in or near the wetland					
accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)					
logging within the wetland					
subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles					
straightening, ditching, dredging, and/or lining of tributary channels					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of timing shift within the wetland		>95% of wetland	5-95% of wetland	<5% of wetland	0
When most of the timing shift began		<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					
Input timing now vs. previously		shift of weeks	shift of days	shift of hours or minutes	0
Flashiness or muting		became very flashy or controlled	intermediate	became mildly flashy or controlled	0
				Sum=	0
				Final Score=	0.00

<b>S2</b>		<b>Accelerated Inputs of Contaminants and/or Salts</b>			
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities					
metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/ gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/nrnp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/nrnp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )					
road salt					
spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Usual toxicity of most toxic contaminants		industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission right-of-way	low density residential	0
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
				Sum=	0
				Final Score=	0.00

<b>S3</b>		<b>Accelerated Inputs of Nutrients</b>			
<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRv, PRv, STR]</i>					
stormwater or wastewater effluent (including failing septic systems), landfills					
fertilizers applied to lawns, ag lands, or other areas in the CA					
livestock, dogs					
artificial drainage of upslope lands					
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
Type of loading		high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	0
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
				Sum=	0
				Final Score=	0.00

S4	<b>Excessive Sediment Loading from Contributing Area</b>				
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
	erosion from construction, in-channel machinery in the CA				
	erosion from off-road vehicles in the CA				
	erosion from livestock or foot traffic in the CA				
	stormwater or wastewater effluent				
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
	accelerated channel downcutting or headcutting of tributaries due to altered land use				
	other human-related disturbances within the CA				
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0	
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment			Sum=	0	
			Final Score=	0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>				
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
	leveling or other grading not to the natural contour				
	tillage, plowing (but excluding disking for enhancement of native plants)				
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
	excavation				
	ditch cleaning or dredging in or adjacent to the wetland				
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0	
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
			Sum=	0	
			Final Score=	0.00	

Wetland ID:	WL-19
Date:	8/14/17
Observer:	MLD, DB
Latitude & Longitude (decimal degrees):	45.668695 -62.652834

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	6.76	Higher	1.17	Lower	6.90	1.90
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	0.50	Lower	0.00	Lower	0.33	0.00
Sediment Retention & Stabilisation (SR)	10.00	Higher	10.00	Higher	10.00	10.00
Phosphorus Retention (PR)	10.00	Higher	10.00	Higher	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	Higher	10.00	Higher	10.00	10.00
Carbon Sequestration (CS)	2.86	Lower			5.68	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	1.65	Lower	2.00	Moderate	3.86	2.44
Amphibian & Turtle Habitat (AM)	4.88	Moderate	2.76	Moderate	6.06	3.20
Waterbird Feeding Habitat (WBF)	3.73	Moderate	2.50	Moderate	2.99	2.50
Waterbird Nesting Habitat (WBN)	1.80	Lower	2.50	Moderate	1.49	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	4.98	Moderate	2.50	Moderate	4.12	2.50
Pollinator Habitat (POL)	6.80	Moderate	0.00	Lower	5.63	0.00
Native Plant Habitat (PH)	0.87	Lower	3.75	Moderate	3.81	3.25
Public Use & Recognition (PU)			1.26	Lower		1.23
Wetland Sensitivity (Sens)			2.71	Lower		3.04
Wetland Ecological Condition (EC)			3.10	Lower		5.83
Wetland Stressors (STR) (higher score means more stress)			7.66	Higher		4.66
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	6.76	Higher	1.17	Lower	6.90	1.90
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	10.00	Higher	9.46	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	0.14	Lower	1.24	Lower	2.46	1.63
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	3.53	Moderate	3.27	Moderate	4.09	2.42
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	4.32	Moderate	2.64	Lower	5.08	2.58
WETLAND CONDITION (EC)			3.10	Lower		5.83
WETLAND RISK (average of Sensitivity & Stressors)			6.09	Moderate		3.85

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 20a,b,c,d
Investigator Name:	Marina Dulmage, Deborah Bear
Date of Field Assessment:	14/08/2017
Nearest Town:	Pictou Landing
Latitude (decimal degrees):	45.667596
Longitude (decimal degrees):	-62.649605
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	2.00
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	no
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	14-Aug-17	Site Identifier: WL-20a,b,c,d	Investigator: MD, DB	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 1 0 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 0 1 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 0 1	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]	
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1		
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0		
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[Fav, FRv, NRv, PH, PU, SBM, WBFv]	
		<100 m	0		
		100 - 500 m	1		
		0.5 - 1 km	0		
		1 - 5 km	0		
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, Fav, FRv, NRv, PH, PU, SBM, STR, WBN]	
		<10 m	0		
		10 - 25 m	0		
		25 - 50 m	0		
		50 - 100 m	0		
		100 - 500 m	1		
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]	
		The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:			
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1		
		<50 m, but completely separated from the ponded water by those features.	0		
		50-500 m, and not separated.	0		
OF13	Distance to Ponded Water	50-500 m, but separated by those features.	0	In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]	
		0.5 - 1 km, and not separated.	0		
		0.5 - 1 km, but separated by those features.	0		
		none of the above (the closest patches or corridors that large are >1 km away).	0		
		The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:			Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1		
		100 m - 1 km	0		
1 - 2 km	0				
2-5 km	0				
5-10 km	0				
OF14	Distance to Large Ponded Water	>10 km	0		
		The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]	
		<100 m	0		
		100 m - 1 km	0		
		1 - 5 km	1		
		5-10 km	0		
10-40 km	0				
OF15	Tidal Proximity	>40 km	0		
		Select one:		[NR, SBM, Sens]	
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0		
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0		
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0		
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	1		
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	0				
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]	
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0		
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0		
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0		
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1		
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column.	0.026	[NR, Sens, SFSv, WCv, WSV]	
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]	
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]	
		The condition is present within the AA.	0		
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0		
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0		
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1		

OF21	Degraded Water Downstream	The problem described above is <b>downslope from the AA</b> , and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	1	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	1	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	1	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	1			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEL_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas.Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .	1	[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: 14 Aug, 2017		Site Identifier: WL-20a,b,c,d		Investigator: MD, DB	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>1</p> <p>1</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>1</p> <p>2</p> <p>3</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>0</p> <p>1</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is: Few or none that meet these criteria.	1	Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: <1% or none	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: <5% of the vegetated part of the AA.	0	Exclude moss growing on trees and rocks. [CS, PH]
		5-25% of the vegetated part of the AA.	1	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is: Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is: Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Intermediate.	1	
		Several (extensive micro-topography).	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are: Few or none.	1	[AM, NR, SBM]
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)] Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA]. none, or <100 sq. m.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	1	
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is: <5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	[AM, WBF, WBN]
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	1	
		>95% of the vegetated part of the AA.	0	
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of: <5% of the herbaceous part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	1	
		>95% of the herbaceous part of the AA.	0	
F18	Sedge Cover	Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy: <5% of the vegetated area, or none.	0	[CS]
		5-50% of the vegetated area.	1	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. Invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	[EC, PH, POL, Sens]
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		some (but <5%) of the upland edge.	0	
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	1	[FR, PR, PU, WBF, WBN]

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
	99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1	
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	1		
		50-95% of the AA.	0		
	>95% of the AA. True for many fringe wetlands.	0		AllWet	
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	1		
		50-75% of the water is shaded.	0		
	>75% of the water is shaded.	0			
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualizing where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
	>95% of the AA.	0			
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	1		
	>2 m change.	0			
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation is most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	1		
		1 - 2 m deep.	0		
	>2 m deep. True for many fringe wetlands.	0			
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
	Neither of above. There are 3 or more depth classes and none occupy >50%.	0			
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	1		
		70-95% of the water.	0		
	>95% of the water.	0			
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		NoOpenPonded1
		5-30% of the ponded water.	1		
		30-70% of the ponded water.	0		
	70-99% of the ponded water.	0			
	100% of the ponded water.	0		AllOpenPond	
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	1		
		30 - 49 m	0		
		50 - 100 m	0		
	> 100 m, or open water is absent at that time.	0			
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
	>75% of the water edge.	1			
F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75%, of the emergent vegetation.	1		

F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly: Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water. Intermediate. Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0 0 1	[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	1		DeepPersist
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is: Little or none. Intermediate. Extensive.	0 1 0	For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	1	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.] persistent (surface water flows out for >9 months/year). seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive). temporary (surface water flows out for <14 days, not necessarily consecutive). none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement) no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	1 0 0 0 0	Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water: mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features. is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0 1 0	"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water]. Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. bumps into herbaceous vegetation but mostly remains in fairly straight channels. bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0 0 0 1 0	[FA, FR, INV, NR, OE, PR, SR, WS]	
F47	pH Measurement	The pH in most of the AA's surface water: was measured, and is: [enter the reading in the column to the right]; was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g. Labrador tea) are prevalent. Enter "1". neither of above. Enter "1".	0 1 1	Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information): TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]; Conductivity is: [enter the reading in µS/cm in the column to the right]; was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1". neither of above	0 0 1	See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE): evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1 0 0	[FA, FR, PH, SBM, Sens, WBF, WBN]	
F50	Groundwater Strength of Evidence	Select first applicable choice. Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5. Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	0 0 1	Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
F51	Internal Gradient	The gradient along most of the flow path within the AA is: <2% or the AA has no surface water outlet (not even seasonally) 2-5% 6-10% >10%	1 0 0 0	This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.				
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:		[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0	
		5 to 30%	0	
		30 to 60%	0	
		60 to 90%	0	
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1	
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):		[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0	
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:		[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0	
		2-5%	0	
		5-30%	0	
		>30%	0	
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	1	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):		Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	1	
		yes, and created or expanded 20 - 100 years ago.	0	
		yes, and created or expanded 3-20 years ago.	0	
		yes, and created or expanded within last 3 years.	0	
		yes, but time of origin or expansion unknown.	0	
		unknown if new or expanded within 20 years or not.	0	
F57	Burn History	More than 1% of the AA's previously vegetated area:		Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0	
		burned 6-10 years ago.	0	
		burned 11-30 years ago.	0	
		burned >30 years ago, or no evidence of a burn and no data.	1	
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:		[PU, STR, WBFv]
		<25%	1	
		25-50%	0	
		>50%	0	
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:		[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1	
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	1	
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0	
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]		[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0	
		<5% and inhabited building is within 100 m of the AA.	0	
		5-50% and no inhabited building is within 100 m of the AA.	0	
		5-50% and inhabited building is within 100 m of the AA.	0	
		50-95%, with or without inhabited building nearby.	0	
		>95% of the AA with or without inhabited building nearby.	1	
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]		[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1	
		5-50%	0	
		50-95%	0	
		>95% of the AA.	0	
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.		[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0	
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0	
		waterfowl hunting.	0	
		fishing.	0	
		trapping of furbearers.	0	
		none of the above.	0	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:		[NRv]
		Within 0-100 m of the AA.	0	
		100-500 m away.	0	
		>500 m away, or no information.	1	
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0	[PH, PR]

BuffAIINat

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

				Data		
S1	<b>Aberrant Timing of Water Inputs</b>					
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>					
	stormwater from impervious surfaces that drains directly to the wetland					
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation				1	
	regular removal of surface or groundwater for irrigation or other consumptive use					
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland					
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)					
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch					
	artificial drains or ditches in or near the wetland					
	accelerated dewatering or channelization of an adjacent or internal channel (incised below the historical water table level)					
	logging within the wetland					
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles					
	straightening, ditching, dredging, and/or lining of tributary channels					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	0		
When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0		
<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>						
Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0		
Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0		
<b>Sum=</b>				0		
<b>Final Score=</b>				0.00		
S2	<b>Accelerated Inputs of Contaminants and/or Salts</b>					
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>					
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities				1	
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )					
	road salt					
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA					
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>					
			Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed farm, pipeline or transmission rights-of-way	low density residential	0	
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0	
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0	
	<b>Sum=</b>				0	
	<b>Final Score=</b>				0.00	
	S3	<b>Accelerated Inputs of Nutrients</b>				
		<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>				
stormwater or wastewater effluent (including failing septic systems), landfills						
fertilizers applied to lawns, ag lands, or other areas in the CA						
livestock, dogs						
artificial drainage of upslope lands						
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>						
		Severe (3 points)	Medium (2 points)	Mild (1 point)		
Type of loading		high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2	
Frequency & duration of input		frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	
AA proximity to main sources (actual or potential)		0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	1	
<b>Sum=</b>				6		
<b>Final Score=</b>				0.67		

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-20a,b,c,d
Date:	8/14/17
Observer:	MLD, DB
Latitude & Longitude (decimal degrees):	45.667596 Lat, -62.649605 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	2.74	Moderate	1.21	Lower	3.69	1.94
Stream Flow Support (SFS)	3.02	Moderate	2.98	Moderate	1.61	2.20
Water Cooling (WC)	5.33	Higher	4.64	Moderate	3.56	3.00
Sediment Retention & Stabilisation (SR)	4.38	Moderate	10.00	Higher	6.03	10.00
Phosphorus Retention (PR)	2.98	Moderate	10.00	Higher	5.66	10.00
Nitrate Removal & Retention (NR)	7.12	Higher	10.00	Higher	6.35	10.00
Carbon Sequestration (CS)	5.11	Moderate			6.69	
Organic Nutrient Export (OE)	7.36	Higher			5.84	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	8.27	Higher	5.01	Higher	5.22	3.55
Aquatic Invertebrate Habitat (INV)	9.53	Higher	9.41	Higher	7.22	6.29
Amphibian & Turtle Habitat (AM)	8.97	Higher	6.20	Higher	8.16	5.53
Waterbird Feeding Habitat (WBF)	10.00	Higher	5.83	Moderate	9.76	5.83
Waterbird Nesting Habitat (WBN)	9.42	Higher	0.00	Lower	7.79	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	8.25	Higher	0.00	Lower	6.82	0.00
Pollinator Habitat (POL)	7.75	Higher	0.00	Lower	6.42	0.00
Native Plant Habitat (PH)	6.09	Higher	5.09	Moderate	5.97	4.41
Public Use & Recognition (PU)			9.20	Higher		6.87
Wetland Sensitivity (Sens)			3.04	Moderate		3.15
Wetland Ecological Condition (EC)			4.83	Moderate		6.88
Wetland Stressors (STR) (higher score means more stress)			3.27	Moderate		2.78
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	2.74	Moderate	1.21	Lower	3.69	1.94
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	4.35	Moderate	10.00	Higher	6.44	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	8.18	Higher	7.38	Higher	5.89	5.06
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	10.00	Higher	7.20	Higher	7.98	4.41
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	7.38	Higher	3.01	Lower	6.61	2.94
WETLAND CONDITION (EC)			4.83	Moderate		6.88
WETLAND RISK (average of Sensitivity & Stressors)			1.88	Lower		2.96

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 21, Boat Harbour
Investigator Name:	Marina Dulmage, Amanda Facey
Date of Field Assessment:	25/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.668806
Longitude (decimal degrees):	-62.647741
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	0.86
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	25-Aug-17	Site Identifier: WL-21	Investigator: MD, AF	
<b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a> GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention & Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian & Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, & Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use & Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool-> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAV, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	1	
		0.5 - 1 km	0	
		1 - 5 km	0	
		>5 km	0	
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAV, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	1	
		>500 m	0	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	1	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	1	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
		>40 km	0	
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1	
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.0121	[NR, Sens, SFSv, WCv, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope from the AA</b> , and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	0	
		>25%	1	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	1	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	1	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEL_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably is not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nestling Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: 25, August 2017	Site Identifier: WL-21	Investigator: MLD, ANF			
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>0</p> <p>5</p> <p>2</p> <p>1</p> <p>0</p> <p>0</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
F9	N Fixers	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		
		<1% or none	1	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	Exclude moss growing on trees and rocks. [CS, PH]
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		The cover of <b>Sphagnum</b> moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		
		<5% of the vegetated part of the AA.	1	
		5-25% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	25-50% of the vegetated part of the AA.	0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	0	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
F12	Ground Irregularity	Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	1	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
		Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		
F13	Upland Inclusions	Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	[AM, NR, SBM]
		Intermediate.	1	
		Several (extensive micro-topography).	0	
F14	Soil Texture	Within the AA, inclusions of upland are:		[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
F15	Shorebird Feeding Habitats	Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
F16	Herbaceous % of Vegetated Wetland	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		[AM, WBF, WBN]
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	0	
		>10,000 sq. m.	0	
F17	Forb Cover	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		[AM, WBF, WBN]
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	1	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
F18	Sedge Cover	>95% of the vegetated part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	0	
F19	Dominance of Most Abundant Herbaceous Species	50-95% of the herbaceous part of the AA.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		>95% of the herbaceous part of the AA.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
F20	Invasive Plant Cover	those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	[EC, PH, POL, Sens]
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
F22	Fringe Wetland	some (but <5%) of the upland edge.	0	[WBF, WBN, WCV, ]
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F23	Lacustrine Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[FR, PR, PU, WBF, WBN]
		The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	1		AllSat2
	99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat1	
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		AllWet
		>95% of the AA. True for many fringe wetlands.	0		
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	1		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation is most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	1		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded1
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
	100% of the ponded water.	0		AllOpenPond	
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
	> 100 m, or open water is absent at that time.	0			
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
F38	Persistent Deepwater Area	Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		DeepPersis
		If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
F40	Isolated Island	Extensive.	0		
		The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface water connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
F43	Outflow Confinement	none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	1		
		During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
F44	Tributary Channel	mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		Inflows
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
F47	pH Measurement	bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
		The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
F48	TDS and/or Conductivity	was measured, and is: [enter the reading in the column to the right].			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
		The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
F49	Beaver Probability	TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row].			
		Conductivity is: [enter the reading in µS/cm in the column to the right].			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
F50	Groundwater Strength of Evidence	neither of above	1		
		Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0		
F51	Internal Gradient	likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		TooSteep
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1		
		Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS.]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
F51	Internal Gradient	Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
		The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	
		<2% or the AA has no surface water outlet (not even seasonally)	1		
F51	Internal Gradient	2-5%	0		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	1
		5 to 30%	0
		30 to 60%	0
		60 to 90%	0
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	1
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	1
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	0
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited). SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorized boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SuppInfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	[PH, PR]
			0

BuffAllNat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1		<b>Aberrant Timing of Water Inputs</b>			
		<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>			
		stormwater from impervious surfaces that drains directly to the wetland			
		water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation			
		regular removal of surface or groundwater for irrigation or other consumptive use			
		flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland			
		a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)			
		excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch			
		artificial drains or ditches in or near the wetland			
		accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)			
		logging within the wetland			
		subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles			
		straightening, ditching, dredging, and/or lining of tributary channels			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
		Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland
		When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago
		<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>			
		Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes
		Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled
				Sum=	0
				Final Score=	0.00

S2		<b>Accelerated Inputs of Contaminants and/or Salts</b>			
		<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>			
		stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities			
		metals & chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/inrp-npr/default.asp?lang=En&amp;n=B85A1846-1</a> )			
		road salt			
		spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
		Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential
		Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly
		AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area
				Sum=	0
				Final Score=	0.00

S3		<b>Accelerated Inputs of Nutrients</b>			
		<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>			
		stormwater or wastewater effluent (including failing septic systems), landfills			
		fertilizers applied to lawns, ag lands, or other areas in the CA			
		livestock, dogs		1	
		artificial drainage of upslope lands			
		<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>			
			Severe (3 points)	Medium (2 points)	Mild (1 point)
		Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential
		Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly
		AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area
				Sum=	3
				Final Score=	0.33

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-21
Date:	8/25/17
Observer:	MLD, ANF
Latitude & Longitude (decimal degrees):	45.668806 Lat, -62.647741 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	7.13	Higher	1.85	Lower	7.19	2.53
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	2.50	Moderate	0.00	Lower	1.67	0.00
Sediment Retention & Stabilisation (SR)	10.00	Higher	10.00	Higher	10.00	10.00
Phosphorus Retention (PR)	10.00	Higher	10.00	Higher	10.00	10.00
Nitrate Removal & Retention (NR)	10.00	Higher	10.00	Higher	10.00	10.00
Carbon Sequestration (CS)	3.03	Lower			5.76	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	2.59	Lower	3.33	Moderate	4.26	3.13
Amphibian & Turtle Habitat (AM)	6.00	Moderate	3.82	Moderate	6.64	3.92
Waterbird Feeding Habitat (WBF)	5.71	Moderate	2.50	Moderate	4.58	2.50
Waterbird Nesting Habitat (WBN)	3.49	Moderate	2.50	Moderate	2.89	2.50
Songbird, Raptor, & Mammal Habitat (SBM)	5.66	Moderate	2.50	Moderate	4.69	2.50
Pollinator Habitat (POL)	6.98	Moderate	0.00	Lower	5.78	0.00
Native Plant Habitat (PH)	3.11	Lower	4.02	Moderate	4.74	3.49
Public Use & Recognition (PU)			2.17	Lower		1.87
Wetland Sensitivity (Sens)			6.61	Higher		4.29
Wetland Ecological Condition (EC)			5.17	Moderate		7.08
Wetland Stressors (STR) (higher score means more stress)			7.91	Higher		4.76
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	7.13	Higher	1.85	Lower	7.19	2.53
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	10.00	Higher	9.47	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	1.11	Lower	2.06	Lower	2.87	2.09
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	4.82	Moderate	4.12	Moderate	4.73	2.85
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	5.01	Moderate	2.80	Lower	5.42	2.74
WETLAND CONDITION (EC)			5.17	Moderate		7.08
WETLAND RISK (average of Sensitivity & Stressors)			9.32	Higher		4.53

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 22, Boat Harbour
Investigator Name:	Marina Dulmage, Deborah Bear
Date of Field Assessment:	8/14/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.673754
Longitude (decimal degrees):	-62.638524
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	31.30
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	14-Aug-17	Site Identifier: WL-22	Investigator: MD, DB	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	1 0 0 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	1	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAv, FRv, NRV, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	1	
		0.5 - 1 km	0	
		1 - 5 km	0	
		>5 km	0	
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAv, FRv, NRV, PH, PU, SBM, STR, WBN]
		<10 m	1	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
		>500 m	0	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Ponded Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Ponded Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	1	
		100 m - 1 km	0	
		1 - 5 km	0	
		5-10 km	0	
		10-40 km	0	
		>40 km	0	
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	1	
		More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	0	
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.019	[NR, Sens, SFSv, WCV, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	1	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	0	

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	0	
		>25%	1	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	1	
		Mostly untrue	0	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	1	
		1- 2 km	0	
		>2 km, or wetland lacks an inlet and/or outlet.	0	
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species).	0	
		none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAS_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: 15/08/2017		Site Identifier: WL-22		Investigator: MLD, DAB	
<p><b>Form F (Field).</b> Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS: Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP TO F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>0</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is: Few or none that meet these criteria.	0	Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: <1% or none	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: <5% of the vegetated part of the AA.	1	Exclude moss growing on trees and rocks. [CS, PH]
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is: Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is: Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Intermediate.	0	
		Several (extensive micro-topography).	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are: Few or none.	1	[AM, NR, SBM]
		Intermediate (1 - 10% of vegetated part of the AA).	0	
		Many (e.g., wetland-upland "mosaic"; >10% of the vegetated AA).	0	
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)] Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and Peat, to 40 cm depth or greater.	0	
		Peat or organic <40 cm deep.	0	
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
			0	
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA]. none, or <100 sq. m.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		100-1000 sq. m.	0	
		1000 - 10,000 sq. m.	1	
		>10,000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is: <5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	[AM, WBF, WBN]
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	1	
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of: <5% of the herbaceous part of the AA.	1	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		5-25% of the herbaceous part of the AA.	0	
		25-50% of the herbaceous part of the AA.	0	
		50-95% of the herbaceous part of the AA.	0	
		>95% of the herbaceous part of the AA.	0	
F18	Sedge Cover	Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy: <5% of the vegetated area, or none.	1	[CS]
		5-50% of the vegetated area.	0	
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
			0	
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	0	[EC, PH, POL, Sens]
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	1	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species none of the upland edge (invasives apparently absent), or AA has no upland edge.	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		some (but <5%) of the upland edge.	1	
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	AllSat2 AllSat1
		<1%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0				
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis  AllWet
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
>95% of the AA. True for many fringe wetlands.	0				
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water within the AA that is shaded by vegetation and other features that are within the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	1		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
>75% of the water is shaded.	0				
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
>95% of the AA.	0				
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	TooSmall
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	1		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
>2 m change.	0				
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	NoPonded
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	1		
>2 m deep. True for many fringe wetlands.	0				
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	0		
		One depth class that comprises 50-90% of the AA's inundated area.	1		
Neither of above. There are 3 or more depth classes and none occupy >50%.	0				
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	1		
>95% of the water.	0				
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue. If false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1  AllOpenPond
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	1		
		70-99% of the ponded water.	0		
100% of the ponded water.	0				
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area in the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	1		
		50 - 100 m	0		
> 100 m, or open water is absent at that time.	0				
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	1		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	1		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	1		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	1		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	1		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/ei/DC/catalogue-E.asp">http://w.snb.ca/geonb1/ei/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 OutNone
		persistent (surface water flows out for >9 months/year).	1		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement).	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	1	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	1		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right].			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row].			
		Conductivity is: [enter the reading in µS/cm in the column to the right].			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	1
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	0
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	1
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	0
		5-30%	0
		>30%	1
F55	Cliffs or Sleep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	1
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	0
		25-50%	0
		>50%	1
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	1
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	1
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	0
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	0
		5-50%	1
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	1
		fishing.	1
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	1
		>500 m away, or no information.	0
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SuppInfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	[PH, PR]

BuffAllNat

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

S1	Aberrant Timing of Water Inputs		Data		
	<i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>				
	stormwater from impervious surfaces that drains directly to the wetland				
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation				
	regular removal of surface or groundwater for irrigation or other consumptive use				
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland		1		
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)		1		
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch				
	artificial drains or ditches in or near the wetland				
	accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)				
	logging within the wetland				
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles				
	straightening, ditching, dredging, and/or lining of tributary channels				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	2
	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	1
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>				
	Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0
	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0
				Sum=	3
				Final Score=	0.25

S2	Accelerated Inputs of Contaminants and/or Salts		Data		
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities		1		
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/npr-npri/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/npr-npri/default.asp?lang=En&amp;nav=B85A1846-1</a> )		1		
	road salt				
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	3
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	1
				Sum=	7
				Final Score=	0.78

S3	Accelerated Inputs of Nutrients		Data		
	<i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills		1		
	fertilizers applied to lawns, ag lands, or other areas in the CA				
	livestock, dogs				
	artificial drainage of upslope lands				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	3
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	1
				Sum=	7
				Final Score=	0.78

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-22
Date:	8/14/17
Observer:	MLD, DB
Latitude & Longitude (decimal degrees):	45.673754 Lat, -62.638524 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	1.57	Lower	3.23	Moderate	2.76	3.80
Stream Flow Support (SFS)	5.00	Moderate	2.83	Moderate	2.67	2.09
Water Cooling (WC)	4.42	Moderate	4.37	Moderate	2.94	2.82
Sediment Retention & Stabilisation (SR)	2.73	Moderate	10.00	Higher	4.86	10.00
Phosphorus Retention (PR)	1.15	Lower	10.00	Higher	4.52	10.00
Nitrate Removal & Retention (NR)	3.02	Lower	10.00	Higher	5.08	10.00
Carbon Sequestration (CS)	4.39	Moderate			6.37	
Organic Nutrient Export (OE)	4.64	Moderate			3.68	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	7.92	Higher	10.00	Higher	5.00	7.94
Aquatic Invertebrate Habitat (INV)	8.97	Higher	7.82	Higher	6.98	5.47
Amphibian & Turtle Habitat (AM)	9.06	Higher	5.59	Higher	8.20	5.12
Waterbird Feeding Habitat (WBF)	8.75	Higher	5.83	Moderate	7.01	5.83
Waterbird Nesting Habitat (WBN)	9.18	Higher	3.33	Moderate	7.59	3.33
Songbird, Raptor, & Mammal Habitat (SBM)	6.05	Moderate	3.33	Moderate	5.00	3.33
Pollinator Habitat (POL)	6.77	Moderate	3.33	Moderate	5.61	3.33
Native Plant Habitat (PH)	1.98	Lower	5.36	Moderate	4.27	4.65
Public Use & Recognition (PU)			3.64	Moderate		2.92
Wetland Sensitivity (Sens)			3.05	Moderate		3.15
Wetland Ecological Condition (EC)			1.38	Lower		4.79
Wetland Stressors (STR) (higher score means more stress)			9.57	Higher		5.47
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	1.57	Lower	3.23	Moderate	2.76	3.80
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	2.65	Lower	10.00	Higher	5.79	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	7.33	Higher	6.31	Moderate	5.52	4.46
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	9.12	Higher	10.00	Higher	6.88	6.19
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	4.73	Moderate	4.31	Lower	5.29	4.21
WETLAND CONDITION (EC)			1.38	Lower		4.79
WETLAND RISK (average of Sensitivity & Stressors)			8.29	Higher		4.31

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

**CoverPage: Basic Description of Assessment**

Site Name:	Wetland 22, Boat Harbour
Investigator Name:	Marina Dulmage, Deborah Bear
Date and Time of Field Assessment:	15/08/2017
Time and Height (m) of High Tide on this date near this location	1.7m, 2:56 AM
Time and Height (m) of Low Tide on this date near this location	0.6m, 9:15 AM
Latitude (decimal degrees):	47.674804
Longitude (decimal degrees):	-62.637198
Is a map based on a formal on-site wetland delineation available?	Yes
What percentage (approx.) of the entire wetland polygon, as shown on the Province's map, could you see well enough to answer most of the Form T questions? i.e., the Assessment Area.	95-100%
Indicate here if you intentionally surveyed for rare plants or rare animals:	Yes
Were you able to ask the site owner/manager about any of the questions?	No
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many <b>tidal</b> wetlands have you assessed previously using WESP-AC? (approx.)	4
<i>Attach an aerial or map showing the approximate boundary of the AA, if smaller than the entire tidal wetland polygon mapped by the province.</i>	
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

## Form OF. WESP-AC for Tidal Wetlands version 2.

#	Indicator	Condition Choices	Data	Explanations
OF1	Province	Mark the province in which the wetland is located by changing the 0 in the column next to it to a "1". Mark only one.		In the automated calculations, this is used as a tag that causes the data to be normalised to the correct province.
		New Brunswick	0	
		Prince Edward Island	0	
		Nova Scotia	1	
		Newfoundland-Labrador	0	
OF2	Upland Edge Contact [UpContact]	Viewing the wetland in Google Earth or other aerial imagery, select one:		In this data form, the terms <i>abut</i> , <i>adjoin</i> , <i>adjacent</i> , <i>contiguous</i> , <i>bordering</i> are used interchangeably. [WP, OX, SRH, WS]
		The wetland has no upland edge (or upland is <1% of perimeter). The wetland is entirely surrounded by (& contiguous with) water or other wetland.	0	
		0-25% of the wetland's perimeter abuts upland (including berms, sand spits, & filled areas). The rest adjoins other wetlands or water that is mostly wider than the wetland.	0	
		26-50% of the wetland's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the wetland. This will be true for many tidal wetlands.	0	
		51-75% of the wetland's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the wetland. This will be true for many tidal wetlands.	1	
		More than 75% of the wetland's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the wetland. Highly sheltered wetlands.	0	
OF3	Marsh Width [Width]	Including any adjacent marsh (whether tidal or not, separated by narrow berm or not), the wetland's vegetated width at the widest point measured as straight-line distance along the approximate runoff flow path (line semi-perpendicular to nearby wide channel, bay, or ocean; see example in Appendix B) is:		See Appendix B for example. It is recognized that average or predominant marsh width would usually be a more predictive indicator than maximum marsh width. Maximum width is specified because it is easier for users to recognize and measure. [SS, WP, WH, SRH, BM, WS]
		<10 m.	0	
		10 - 50 m.	0	
		50 - 100 m.	0	
		100 - 1000 m (1 km).	1	
		1 - 2 km.	0	
		>2 km.	0	
OF4	Marsh Area [Area]	Including both the wetland and all adjacent wetland (whether tidal or not, separated by berm or not), the total wetland area is:		Throughout this data form, in the unlikely event that a measured value falls exactly on the break point between two successive choices, (e.g., 0.1-0.5 ha and 0.5-1 ha, and the area is exactly 0.5 ha), choose the higher of the two ranges. [SS, WP, WH, SRH, BM]
		<0.1 ha.	0	
		0.1 - 0.5 ha.	0	
		0.5 - 1 ha.	0	
		1.0 - 10 ha.	0	
		10 - 100 ha.	1	
		> 100 ha.	0	
OF5	Wave Exposure [Waves]	Part of the wetland is occasionally exposed to waves from a stretch of open subtidal water that is considerably wider than the wetland, and those waves are likely to force flooding of the wetland higher and deeper than usually caused by tides alone. See example in Appendix B. Enter 1= yes, 0= no.	1	See Appendix B for example. Sites adjoining the ocean or large bays are most vulnerable; sites on rivers seldom are. Disregard the direction of the prevailing or storm-driven winds. If the wetland is behind a sand spit or artificial berm evaluate whether that is likely to be breached at least once annually by waves. [OX, WH, WS]
OF6	Branched Tidal Channels [TideChan]	Small "blind" channels (not connected to freshwater streams) are:		See Appendix B for examples. [OX, FH, WH]
		Absent.	0	
		Present, but multibranch networks are few and/or not well developed.	1	
		Present, and multibranch networks are extensive and well developed (see example in Appendix B).	0	
OF7	Rivers and Tributaries [Trib]	Select first true statement. The wetland:		See Appendix B for examples. [OX, FH, WH, WS]
		Is inundated daily by water from a major river (channel extends >5 km inland with no fish blockages insofar as is known, large watershed).	0	
		Is inundated <b>only</b> by a mapped perennial stream (channel extends <5 km inland, smaller watershed).	1	
		Neither of above, but a mapped stream or river is within 1 km.	0	
		None of the above.	0	
OF8	Distance to Freshwater Pond [DistLake]	The distance to the nearest freshwater pond larger than 1 hectare is: <u>Note:</u> Lakes and marshes and fens that remain flooded year-round may be included.		[WH]
		< 1 km.	1	
		1 - 2 km.	0	
		2 - 3 km.	0	
		3 - 5 km.	0	
		> 5 km.	0	
OF9	Distance to Road [DistRd]	The distance from the AA edge to the nearest road or parking lot that could contribute runoff to the wetland is:		[BM]
		< 2 m.	0	
		2 - 10 m.	0	
		10 - 30 m.	1	
		30 - 100 m.	0	
		> 100 m, or roads that could contribute runoff to the wetland are absent.	0	
OF10	Distance to Nutrient or Contaminant Source [DistPollu]	The distance to the nearest fertilised lawn or row crops, residence with a septic system, pasture with livestock, drained peatland, or other feature that could contribute elevated levels of nutrients and/or contaminants to the wetland, is:		[BM]
		< 10 m.	0	
		10 - 20 m.	1	
		20 - 50 m.	0	
		50 - 100 m.	0	
		> 100 m, or features that could contribute contaminated runoff to the wetland are absent.	0	
OF11	Developed Land in Runoff Contributing Area [BuffPctDevel]	Within 100 m upslope from the wetland's upland edge, the percentage that is pavement, buildings, lawn, or drained land is:		[BM]
		None or trace (<1%).	0	
		1- 10%.	1	
		10 - 25%.	0	
		25 - 50%.	0	
		50 - 75%.	0	
		> 75%.	0	

OF12	Open Land in Vicinity [Openland]	Within a circle of radius 5 km centered on the wetland, the percentage (excluding any ocean or bay) that is cropland, marsh, lakes, ponds, or grassland is: [Note: Do not include bogs or newly mined lands as "open land".]		[WH]
		none or trace (<1%).	0	
		1 - 10%.	0	
		10 - 25%.	1	
		25 - 50%.	0	
50 - 75%.	0			
> 75%.	0			
OF13	Salt Marsh Landscape [Wetscape]	Along the shoreline within the 5 km circle, the percentage of the shoreline that is mapped as salt marsh (including this one) is: [Note: "Shoreline" is the line defined by permanent flooding. Channels count as shoreline if wider than the marshes they intersect or adjoin.]		[FH, WH, SRH, BM]
		<1%.	0	
		1 - 10%.	1	
		10 - 25%.	0	
		25 - 50%.	0	
> 50%.	0			
OF14	Slope Nearby [Spread]	As viewed in the Toporama map ( <a href="http://www.atlas.gc.ca/toporama/">http://www.atlas.gc.ca/toporama/</a> ) at maximum zoom, 10 m vertical interval, there is a <b>topographic contour line</b> within 1 km of the wetland's upland edge or within a distance that is less than the wetland's maximum width. See example in <b>Appendix B</b> . Enter 1= yes, 0= no.	1	See Appendix B for illustrated example. Although this indicator's assessment procedure is far too coarse to be definitive, it is used to support the principle that tidal wetlands adjoined by steep topography are less able to "migrate" inland in response to future rise in sea level. Better information on local effects of sea level rise will be available for some communities; check likely sources and use that to respond to this question if possible. [WS]
OF15	Tidal Inflow Restriction [Restrict]	Man-made berms, levees, or dykes which limit tidewater movement into a part of the AA that historically would have experienced daily tidal flooding are: [Note: Restriction by natural sand or gravel spits or beaver dams does not count. Restriction by culverts and tidegates does count.]		[OX, FH, WS]
		Absent (but a levee or berm may separate tidal wetland and upland).	1	
		Present, and tidal inflow is mildly affected. If external waters are saline, then characteristic salt marsh vegetation still dominates within the wetland but restriction may have allowed invasion by cat-tail, bulrush, or other freshwater-associated plants, although usually only a relatively small proportion of the wetland is affected.	0	
		Present, and tidal inflow is strongly affected. If external waters are saline, restriction has eliminated or greatly reduced characteristic salt marsh vegetation or such species are largely confined to limited areas near saltwater inflow points. Also mark this choice if fish cannot enter the wetland from marine waters due to blockage by tidegate or improperly placed culvert.	0	
OF16	Ditching [Ditch]	Ditches, artificially straightened channels, and/or channel connectors are:		See Appendix B for illustrations. [WP, FH]
		Absent.	0	
		Present, but few and localized within the wetland.	1	
		Present, and a few large/long ditches or a dense network in at least part of the wetland.	0	
OF17	Soil Compaction [SoilCompac]	Vehicle tracks in the mud or flattened vegetation suggest construction equipment or ATVs have entered the wetland, or there are remnants of old dykes within the wetland.		[WP]
		Absent.	0	
		Present, but few and localized within the wetland.	1	
		Present, and extensive & widely distributed within the wetland.	0	
OF18	Tidal Range [TideAmp]	Mark the annual tidal range (most extreme tide range on any day during the year) by going to this web site: <a href="http://tides.gc.ca/eng/data/predictions">http://tides.gc.ca/eng/data/predictions</a> selecting the tide station nearest the wetland which has data for May 6-8, 2016, and then calculating the height difference between the highest high tide and lowest low tide on those dates.	1.6	It is important to specify the year 2016 because the range that WESP-AC uses to normalise your tide data is based on those dates in that year. Ideally, this indicator would be based on 19 years of tidal data at each location, but that was not easily available during WESP-AC development. [OX, FH, WS]
OF19	Barrier Island	The wetland is within 1 km of a barrier island with >1 ha bare or sparsely vegetated area, and with no occupied buildings. Enter: yes= 1, no= 0.	0	See Appendix B for example. [WH]
OF20	Growing Degree Days [GrowDays]	Open Google Earth and click on the GDD.kmz file, navigate to your site's location, and click its associated grid cell. The "grid code" is the Growing Degree Days value. Enter that number in the next column. If grid does not include your site, use value from the closest grid cell.	2392	[OX, WH]
OF21	Conservation Designation [ConsDesig]	The wetland is all or part of an area designated by the provincial government or the Nature Conservancy of Canada for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. In NB: With GeoNB, click on Candidate PNA Map Viewer to identify Environmentally Significant Area, Protected Natural Area. In NS: With Provincial Landscape Viewer, see Protected Areas.	0	"Provincially Significant Wetlands" (a NB designation) is not part of this question because all NB tidal wetlands have been so designated. [PUR]
OF22	Conservation Investment [ConsInvest]	The wetland is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.	0	Do not include lands that were preserved for reasons mainly unrelated to the wetlands they contain. [PUR]
OF23	Mitigation Investment [MitInvest]	The wetland is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.	0	[PUR]
OF24	Sustained Scientific Use [SciUse]	Plants, animals, or water in the wetland have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the wetland is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.	0	[PUR]
OF25	Species of Conservation Concern [RareFish, RareOther, RareWbird, RareSbird, RarePlants]	Within the past 20 years, in the wetland (or in similar tidal habitat within 1 km of the wetland), qualified observers have documented (mark all applicable):		Augment your own knowledge (and optional surveys) with a data request to the ACCDC and contacts with knowledgeable local experts. [FH, WH, BM]
		Presence of one or more of the <b>plant</b> species listed in the TidalPlants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>fish</b> species listed in the TidalFish_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species of conservation concern as listed in the TidalWaterbirds_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>songbird, raptor, or mammal</b> species of conservation concern as listed in the TidalSongbird_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-August for most species).	1	
Presence of one or more <b>other</b> species of conservation concern as listed in the Tidal_Others_Rare worksheet of the accompanying SupplInfo file.	0			
None of the above, or no data.	0			
OF26	Important Bird Area or Ramsar wetland [IBirdArea]	The wetland is all or part of an officially designated Important Bird Area (IBA) or a Wetland of International Importance (Ramsar wetland). Enter 1= yes, 0= no.	0	Ramsar is an international convention which has a formal nominating and voting procedure for recognising wetlands of international significance. Currently, Atlantic Canada has 8 such areas. For boundaries, see: <a href="http://www.ramsar.org/wetland/canada">http://www.ramsar.org/wetland/canada</a> . IBAs are designated by the American Bird Conservancy based on nominations from local experts. For boundaries, open the KMZ file that accompanies this calculator, called IBAs_Canada.
OF27	Wetland Bird Concentration Area [BirdConc]	In this wetland or adjacent intertidal habitat, review existing data (online at ebird.org) or conduct your own surveys. If numbers of individual birds have exceeded those shown for the same species in the BirdCriteria worksheet, or if the wetland is within an area listed in the BirdHotspots worksheet, enter: yes= 1, no= 0. For NS and NB, also open the NB-NS Shorebirds KMZ file that accompanies this calculator to determine if the wetland is within 1 km of any of those places.	0	[WH]
OF28	Black Duck Nesting Area [Bduck]	Open Google Earth and then open and overlay the BlackDuck.kmz file. If necessary adjust its alignment and opacity. The predicted density (pairs per 25 sq. km) of nesting American Black Duck in the vicinity of the wetland is:		A hard-copy version of the same map is in Appendix A of the Manual and may be easier to read. [WH]
		<10.	0	
		10 to 20.	0	
		20 to 30.	0	
		>30.	0	
No information (off the map).	1			

#	Indicator	Categorical Choices	Data
T1	High Zone Extent [PctHigh]	The percentage of the wetland's vegetation that has NO tidal water beneath it during most daily high tides of the year (i.e., the HIGH ZONE) is:	
		None, or <1% and narrower than 2 m.	0
		1-10%.	0
		10-25%.	0
		26-50%.	0
		51-75%.	0
		75-90%.	1
		>90%.	0
T2	Extreme High as % of Entire High Zone [PctKing]	Within the High Zone (i.e., the part of the wetland you can still see at daily high tide), the percentage that is flooded only monthly or even less often (T2 yellow area in the above diagram) is:	
		<10% of the High Zone.	0
		10-25% of the High Zone.	0
		26-50% of the High Zone.	0
		>50% of the High Zone.	1
T3	Bare Ground or Thatch: High Zone [Bare]	The ground condition in the HIGH ZONE, as it would exist in late summer and <b>when viewed from about 1 m above the</b>	
		Little or no (<5%) <i>bare ground</i> or dead <i>attached</i> plant material (thatch) is visible between erect stems or under canopy. This can occur if ground surface is extensively blanketed by graminoids with great stem densities.	1
		Some (5-20%) bare ground or thatch is visible. Herbaceous plants have moderate stem densities.	0
		Much (20-50%) bare ground or thatch is visible. Low stem density and/or tall plants with little near-ground foliage.	0
		Mostly (>50%) bare ground or thatch.	0
T4	Salt Pannes & Pools [Pans]	Within the High Zone, the number of pannes and pools (natural semi-circular depressions or ponds with radius >1 m which hold stagnant surface water between high tides, and may be flooded by tides only infrequently) is: [Note: Check the aerial image before answering this.]	
		Few (<2 per hectare) or none.	1
		Intermediate.	0
		Several (>5 per hectare).	0
T5	Forb Cover [Forbs]	In the High Zone (and entirely within the TIDAL wetland), the areal cover of <b>forbs</b> reaches an annual maximum of:	
		<1% of the herbaceous cover.	0
		1-25% of the herbaceous cover.	1
		25-50% of the herbaceous cover.	0
		50-95% of the herbaceous cover.	0
		>95% of the herbaceous cover.	0
T6	Shrub Cover [Shrubs]	In the High Zone (and entirely within the TIDAL wetland), living woody vegetation shorter than 3 m and not beneath a tree canopy comprises:	
		<1% (or none) of the vegetated area reached only by monthly or annual high tide.	1
		1-5% of the vegetated area reached by monthly or annual high tide.	0
		5-25% of the vegetated area reached by monthly or annual high tide.	0
		>25% of the vegetated area reached by monthly or annual high tide.	0
T7	Perches [Perch]	Within the wetland, objects that project >1 m above the ground surface and could serve as perches (e.g., fenceposts, utility poles, boardwalks, goose nesting structures, stumps, boulders, islands of shrubs or trees) are:	
		Few (<1 per hectare) or none .	1
		Intermediate.	0
		Several (>3 per hectare).	0
T8	Plant Species Dominance [Pdom]	In the High Zone, the 2 most common vascular plant species together comprise:	
		<20% of the zone's vegetated area (most species-rich, no dominants or co-dominants).	0
		20-40% of the zone's vegetated area.	0
		40-60% of the zone's vegetated area.	0
		60-80% of the zone's vegetated area.	1
		>80% of the zone's vegetated area (monotypic or nearly so).	0

T9	Exotic Plant Cover [Invas]	In the High Zone (and entirely within the TIDAL wetland), the areal cover of exotic plants (just the species in last column) is:			
		None, or trace.	1		
		1-5% of the herbaceous cover.	0		
		5-25% of the herbaceous cover.	0		
		25-50% of the herbaceous cover.	0		
T10	Core Area 1 [NoVis]	>50% of the herbaceous cover.	0		
		The percentage of the High Zone almost never visited by humans during an average growing season probably comprises: [Note: Do not include visitors on trails outside of the wetland unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail.]			
		<5% and no inhabited building is within 100 m of the wetland.	1		
		<5% and inhabited building is within 100 m of the wetland.	0		
		5-50% and no inhabited building is within 100 m of the wetland.	0		
		5-50% and inhabited building is within 100 m of the wetland.	0		
T11	Core Area 2 [MuchVis]	50-95%.	0		
		>95% of the High Zone. This is the most frequent choice for tidal wetlands in this region.	0		
		The percentage of the High Zone visited by humans almost daily for several weeks during an average year probably comprises: [Note: Do not include visitors on trails outside of the wetland unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail.]			
		<5%. This is the most frequent choice for tidal wetlands in this region, except in some visited often by many hunters.	0		
T12	Visibility [Visibil]	5-50%.	1		
		50-95%.	0		
		>95% of the High Zone.	0		
		The maximum percent of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the wetland is (select one):			
T13	Consumptive Uses (Provisioning Services) [Consump]	<25%.	0		
		25-50%.	0		
		>50%.	1		
		Recent evidence was found within the wetland of the following potentially-sustainable consumptive uses. Mark all that apply.			
		Haying.	0		
T14	Soil Texture [SoilTex]	Grazing.	0		
		Shellfish or bait worm harvest.	0		
		Waterfowl hunting or furbearer trapping.	1		
		Fishing.	1		
		None of the above (no evidence).	0		
T15	Salinity	The texture of soil in the <b>uppermost</b> layer, but excluding live roots, in the majority of the HIGH ZONE, is:			
		<b>Loamy</b> : soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0		
		<b>Fines</b> : includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0		
		<b>Organic</b>	0		
T16	Measured Salinity [Salin]	<b>Coarse</b> : includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	1		
		Was surface water salinity measured? If yes, continue with next question. If no, <b>go to T17</b> .			
		The surface water salinity along the wetland's seaward edge is: [Insert reading in next column, in parts per thousand; 1 ppt = 1000 ppm = 1000 mg/L].			
		T17	Inferred Salinity [SalinClass]	Based on the wetland's dominant plant species (see the PlantList worksheet) and proximity to contributing freshwater rivers and streams, the summertime salinity in most of the wetland is likely:	
				Oligohaline (mostly fresh or slightly brackish plants, usually < 5 ppt).	0
Mesohaline (brackish).	0				
T18	Plant Richness [PlantRich]	Euryhaline (few or no freshwater plants, near seawater strength, usually >30 ppt).	1		
		See the PlantList worksheet. If you have the skills to identify ALL the plants, survey as much of the wetland as time and safety allow. In the worksheet, mark with a "1" the species you find. The number of species will be automatically tallied. Transfer that number to the next column. If you are not confident of your skills to identify ALL the species or for other reasons cannot survey the plants, leave a "0" in the next column.	5		

**PLANT CHECKLIST for Tidal WESP-AC.** DIRECTIONS: Print list & take in field. In first column mark with "1" all species found, transfer to spreadsheet. Bold font= common species. Red= rare. Blue= exotic. All have been found in the region's tidal wetlands, many only near the upland edge or in tidal wetlands with substantial freshwater inflow.

Data	Scientific Name	Common Name	Freshwater Indicator
1	<i>Achillea millefolium</i>	Common yarrow	
	<i>Agalinis maritima</i> [RARE in NS]	Saltmarsh agalinis	
	<i>Agrostis gigantea</i>	Redtop	Yes
	<b><i>Agrostis stolonifera</i></b>	Creeping bentgrass	
	<i>Anthoxanthum nitens</i>	Vanilla sweet grass	
	<b><i>Argentina egedii</i> (<i>Potentilla anserina</i>)</b>	Pacific silverweed	
	<i>Atriplex franktonii</i> [RARE]	Frankton's saltbush	
	<b><i>Atriplex</i> spp.</b>	Saltbush or orache	
	<i>Baccharis halimifolia</i> [RARE in NS]	Eastern baccharis	
	<i>Bidens hyperborea</i> [RARE in NS]	Estuary beggarticks	
	<i>Blysmus (Scirpus) rufus</i> [RARE in NB-PEI]	Red bulrush	
	<i>Bromus inermis</i>	Smooth brome	Yes
1	<i>Calystegia (Convolvulus) sepium</i>	Hedge false bindweed	
	<i>Carex hormathodes</i>	Marsh straw sedge	
	<i>Carex mackenziei</i>	Mackenzie's sedge	
	<b><i>Carex paleacea</i></b>	<b>Chaffy sedge</b>	
	<i>Carex salina</i> [RARE in NB]	Salt marsh sedge	
	<i>Carex tenera</i>	Quill sedge	
	<i>Centaurea nigra</i>	Lesser knapweed	
	<i>Chenopodium</i> spp.	Goosefoot spp.	
	<i>Cotula coronopifolia</i> [EXOTIC]	Common brassbuttons	
	<i>Deschampsia caespitosa</i> [RARE in PEI]	Tufted hairgrass	
	<b><i>Distichlis spicata</i></b>	<b>Saltgrass</b>	
	<i>Eleocharis parvula</i>	Dwarf spikerush	
	<i>Eleocharis rostellata</i>	Beaked spikerush	
	<i>Eleocharis uniglumis</i>	Single-glumed spikerush	
	<i>Elymus</i> spp.	Wildrye spp.	
	<i>Erechtites hieraciifolius</i>	Eastern burnweed	
	<b><i>Festuca rubra</i></b>	Red fescue	
	<i>Galium palustre</i>	Common marsh bedstraw	
	<b><i>Glaux maritima</i></b>	<b>Sea milkwort</b>	
	<i>Hierochloa odorata</i>	Sweetgrass	
	<i>Hordeum jubatum</i>	Foxtail barley	
	<i>Iva frutescens</i>	Big-leaved marsh-elder	
	<b><i>Juncus balticus (arcticus)</i></b>	Arctic sedge	
	<i>Juncus bulbosus</i>	Bulbous rush	

	<i>Juncus filiformis</i>	Thread rush	
	<b><i>Juncus gerardii</i></b>	<b>Saltmeadow rush</b>	
1	<b><i>Lathyrus japonicus</i></b>	<b>Beach pea</b>	
	<i>Ligusticum scoticum</i>	Scottish licorice-root	
	<b><i>Limonium carolinianum (nashii)</i></b>	<b>Lavender thrift</b>	
	<i>Limosella australis</i> [RARE in PEI]	Southern mudwort	Yes
	<i>Myrica gale</i>	Sweetgale	Yes
	<i>Phalaris arundinacea</i> [EXOTIC]	Reed canary-grass	Yes
	<i>Phragmites australis</i> [EXOTIC]	Common reed	
	<i>Plantago major</i> [EXOTIC]	Common plantain	Yes
	<b><i>Plantago maritima</i></b>	<b>Seaside plantain, goose tongue</b>	
	<i>Poa</i> spp.	Grass spp.	Yes
	<i>Polygonum</i> spp.	Knotweed spp.	Yes
	<b><i>Puccinellia</i> spp.</b>	<b>Alkaligrass spp.</b>	
	<i>Ranunculus cymbalaria</i>	Seaside buttercup	
	<i>Ranunculus sceleratus</i>	Cursed buttercup	Yes
	<i>Rosa rugosa</i> [EXOTIC]	Rugosa rose	
	<i>Rumex pallidus</i> [RARE in NB]	Seaside dock	
	<i>Rumex</i> spp.	Dock spp.	
	<i>Ruppia maritima</i>	Widgeongrass	
	<i>Sagina nodosa</i>	Knotted pearlwort	Yes
	<b><i>Salicornia maritima (europaea)</i></b>	<b>Slender grasswort</b>	
	<i>Samolus valerandi</i> (ssp. <i>parviflorus</i> = RARE in NS &	Seaside brookweed	Yes
	<i>Scirpus (Bolboschoenus) maritimus</i>	Saltmarsh bulrush	
	<i>Scirpus (Schoenoplectus) americanus</i>	Olney's bulrush	
	<b><i>Scirpus (Schoenoplectus) tabernaemontanii</i></b>	<b>Softstem bulrush</b>	Yes
	<i>Scirpus microcarpus (rubrotinctus)</i>	Panicked bulrush	Yes
	<i>Scutellaria galericulata</i>	Marsh skullcap	Yes
	<i>Senecio</i> spp.	Ragwort spp.	Yes
	<i>Solidago canadensis</i>	Canada goldenrod	Yes
	<i>Solidago gigantea</i>	Giant goldenrod	Yes
	<b><i>Solidago sempervirens</i></b>	<b>Seaside goldenrod</b>	
	<b><i>Spartina alterniflora</i></b>	<b>Smooth cordgrass</b>	
1*	<b><i>Spartina patens</i></b>	<b>Saltmeadow cordgrass</b>	
	<b><i>Spartina pectinata</i></b>	<b>Prairie cordgrass</b>	
	<i>Spergularia</i> spp.	Sandspurry spp.	
	<i>Stellaria humifusa</i> [RARE in NS & PEI]	Saltmarsh starwort	
	<i>Suaeda linearis</i>	Annual seepweed	
	<i>Suaeda maritima</i>	Herbaceous seepweed	
	<i>Suaeda rollandi</i> [RARE in NS & NB]	Horned sea-blite	
	<i>Symphotrichum laurentianum</i> [RARE in NB-PEI]	Gulf of St. Lawrence aster	
	<i>Symphotrichum subulatum</i> [RARE in NB-PEI]	Annual saltmarsh aster	
	<i>Thinopyrum pycnanthum</i>	Tick quackgrass	
	<i>Trifolium</i> spp.	Clover spp.	
	<i>Triglochin gaspensis</i> [RARE in PEI]	Gaspé Peninsula arrowgrass	



	<b>New Brunswick</b>		<b>Nova Scotia</b>	
<b>Functions or Attributes</b>	<b>Normalised Score</b>	<b>Rating</b>	<b>Normalised Score</b>	<b>Rating</b>
Storm Surge Interception (SS)	6.49	Higher	6.99	Higher
Water Purification (WP)	2.55	Lower	3.59	Moderate
Organic Nutrient Export (OX)	7.70	Higher	7.82	Higher
Fish Habitat (FH)	4.69	Moderate	4.60	Moderate
Waterbird Habitat (WH)	2.16	Lower	1.84	Lower
Songbird & Raptor Habitat (SRH)	7.86	Higher	8.57	Higher
Biodiversity Maintenance (BM)	3.36	Lower	3.78	Moderate
Wetland Stability (WS)	4.33	Moderate	5.38	Moderate
Public Use & Recognition (PUR)	10.00	Higher	10.00	Higher

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 23a,b,c
Investigator Name:	Marina Dulmage, Deborah Bear
Date of Field Assessment:	14/08/2017
Nearest Town:	Pictou Landing
Latitude (decimal degrees):	n/a
Longitude (decimal degrees):	n/a
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	2.00
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	no
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	14-Aug-17	Site Identifier: WL-23a,b,c	Investigator: MD, DB	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 0 1 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 0 1 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [ <i>This is nearly always the answer in relatively undeveloped landscapes.</i> ]	0 0 0 1 0 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 0 0 1 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. <b>SKIP to OF10.</b>	0 0 0 0 1	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	1	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	0	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool-> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria. [FAV, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	1	
		0.5 - 1 km	0	
		1 - 5 km	0	
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler->Line tool. Or use the GeoNB's Draw Line tool. [AM, FAV, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	1	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0=no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
		The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
OF13	Distance to Ponded Water	0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
		none of the above (the closest patches or corridors that large are >1 km away).	0	
		The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
OF14	Distance to Large Ponded Water	1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
		>10 km	0	
		The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headdtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
OF15	Tidal Proximity	100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
		>40 km	0	
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	1	
OF17	Flood Damage from Non-tidal Waters	More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	0	
		Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
OF18	Relative Elevation in Watershed	Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column..	0.024	[NR, Sens, SFSv, WCV, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope from the AA</b> , and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	1	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	0	
		10 to 25%	1	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	1	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	0	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	1			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEL_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species). none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called <b>IBAs_Canada</b> . The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nestling Area	In Google Earth, open the KMZ file that accompanies this calculator, called <b>BlackDuck</b> . Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called <b>NB_DeerWinteringAreas</b> . Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .	1	[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 14, 2017		Site Identifier: WL-23a,b,c		Investigator: MD, DB	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>0</p> <p>1</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>1</p> <p>1</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>1</p> <p>1</p> <p>2</p> <p>3</p> <p>1</p> <p>1</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>1</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>0</p> <p>1</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	1	
F9	N Fixers	Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
F10	Sphagnum Moss Extent	50-75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	Exclude moss growing on trees and rocks. [CS, PH]
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	1	
F11	% Bare Ground & Thatch	25-50% of the vegetated part of the AA.	0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		50-95% of the vegetated part of the AA.	0	
		>95% of the vegetated part of the AA.	0	
		Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	
F12	Ground Irregularity	Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
		Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0	
F13	Upland Inclusions	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		[AM, NR, SBM]
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	0	
		Intermediate.	1	
F14	Soil Texture	Several (extensive micro-topography).	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		Within the AA, inclusions of upland are:		
		Few or none.	1	
		Intermediate (1 - 10% of vegetated part of the AA).	0	
F15	Shorebird Feeding Habitats	Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
F16	Herbaceous % of Vegetated Wetland	Peat or organic <40 cm deep.	0	[AM, WBF, WBN]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	0	
		100-1000 sq. m.	0	
F17	Forb Cover	1000 - 10,000 sq. m.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		>10,000 sq. m.	1	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	0	
F18	Sedge Cover	25-50% of the herbaceous part of the AA.	0	[CS]
		50-95% of the herbaceous part of the AA.	1	
		>95% of the herbaceous part of the AA.	0	
		Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy:		
F19	Dominance of Most Abundant Herbaceous Species	<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
F20	Invasive Plant Cover	50-95% of the vegetated part of the AA.	1	[EC, PH, POL, Sens]
		>95% of the vegetated part of the AA.	0	
		Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following:		
		those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
F21	Invasive Cover Along Upland Edge	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
F22	Fringe Wetland	invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	[WBF, WBN, WCV, ]
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
F23	Lacustrine Wetland	none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	[FR, PR, PU, WBF, WBN]
		some (but <5%) of the upland edge.	0	
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
		During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	
		The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	1	

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	1		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	1		
		50-75% of the water is shaded.	0		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualizing where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	1		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	1		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	1		
		70-95% of the water.	0		
		>95% of the water.	0		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	1	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded1
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	1		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
		100% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	1		
		30 - 49 m	0		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	1		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	1		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	1		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	1		DeepPersist
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	1		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	1	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapefiles from <a href="http://w.snb.ca/geon11/e/DC/catalogue-E.asp">http://w.snb.ca/geon11/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	1		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement).	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	1		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g. Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than ~1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSteep
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	0
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	0
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	1
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	0
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible <u>in</u> (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	1
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: <i>[Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]</i>	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: <i>[see note above]</i> .	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorized boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SupplInfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	[PH, PR]
			0

BuffAINat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1	<p><b>Aberrant Timing of Water Inputs</b></p> <p><i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i></p> <p>stormwater from impervious surfaces that drains directly to the wetland</p> <p>water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation</p> <p>regular removal of surface or groundwater for irrigation or other consumptive use</p> <p>flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland</p> <p>a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)</p> <p>excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch</p> <p>artificial drains or ditches in or near the wetland</p> <p>accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)</p> <p>logging within the wetland</p> <p>subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles</p> <p>straightening, ditching, dredging, and/or lining of tributary channels</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Spatial extent of timing shift within the wetland</td> <td style="text-align: center;">&gt;95% of wetland</td> <td style="text-align: center;">5-95% of wetland</td> <td style="text-align: center;">&lt;5% of wetland</td> <td style="text-align: center;">0</td> </tr> <tr> <td>When most of the timing shift began</td> <td style="text-align: center;">&lt;3 yrs ago</td> <td style="text-align: center;">3-9 yrs ago</td> <td style="text-align: center;">10-100 yrs ago</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="5"><i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i></td> </tr> <tr> <td>Input timing now vs. previously</td> <td style="text-align: center;">shift of weeks</td> <td style="text-align: center;">shift of days</td> <td style="text-align: center;">shift of hours or minutes</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Flashiness or muting</td> <td style="text-align: center;">became very flashy or controlled</td> <td style="text-align: center;">intermediate</td> <td style="text-align: center;">became mildly flashy or controlled</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>0</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.00</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	0	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>					Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0	<b>Sum=</b>				<b>0</b>	<b>Final Score=</b>				<b>0.00</b>
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S2	<p><b>Accelerated Inputs of Contaminants and/or Salts</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities</p> <p>metals &amp; chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/inrp-npri/default.asp?lang=En&amp;nav=B85A1846-1</a>)</p> <p>road salt</p> <p>spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Usual toxicity of most toxic contaminants</td> <td style="text-align: center;">industrial effluent, mining waste, unmanaged landfill</td> <td style="text-align: center;">cropland, managed landfill, pipeline or transmission rights-of-way</td> <td style="text-align: center;">low density residential</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td style="text-align: center;">frequent and year-round</td> <td style="text-align: center;">frequent but mostly seasonal</td> <td style="text-align: center;">infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">0</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td style="text-align: center;">0 - 15 m</td> <td style="text-align: center;">15-100 m or in groundwater</td> <td style="text-align: center;">in more distant part of contributing area</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>0</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.00</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	0	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0	<b>Sum=</b>				<b>0</b>	<b>Final Score=</b>				<b>0.00</b>
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S3	<p><b>Accelerated Inputs of Nutrients</b></p> <p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i></p> <p>stormwater or wastewater effluent (including failing septic systems), landfills</p> <p>fertilizers applied to lawns, ag lands, or other areas in the CA</p> <p>livestock, dogs</p> <p>artificial drainage of upslope lands</p> <p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Severe (3 points)</th> <th style="text-align: center;">Medium (2 points)</th> <th style="text-align: center;">Mild (1 point)</th> <th></th> </tr> </thead> <tbody> <tr> <td>Type of loading</td> <td style="text-align: center;">high density of unmaintained septic, some types of industrial sources</td> <td style="text-align: center;">moderate density septic, cropland, secondary wastewater treatment plant</td> <td style="text-align: center;">livestock, pets, low density residential</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Frequency &amp; duration of input</td> <td style="text-align: center;">frequent and year-round</td> <td style="text-align: center;">frequent but mostly seasonal</td> <td style="text-align: center;">infrequent &amp; during high runoff events mainly</td> <td style="text-align: center;">3</td> </tr> <tr> <td>AA proximity to main sources (actual or potential)</td> <td style="text-align: center;">0 - 15 m</td> <td style="text-align: center;">15-100 m or in groundwater</td> <td style="text-align: center;">in more distant part of contributing area</td> <td style="text-align: center;">1</td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Sum=</b></td> <td style="text-align: center;"><b>6</b></td> </tr> <tr> <td colspan="4" style="text-align: right;"><b>Final Score=</b></td> <td style="text-align: center;"><b>0.67</b></td> </tr> </tbody> </table>		Severe (3 points)	Medium (2 points)	Mild (1 point)		Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	2	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	3	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	1	<b>Sum=</b>				<b>6</b>	<b>Final Score=</b>				<b>0.67</b>
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S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-23a,b,c
Date:	8/14/17
Observer:	MLD, DB
Latitude & Longitude (decimal degrees):	n/a

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	2.74	Moderate	1.20	Lower	3.69	1.94
Stream Flow Support (SFS)	3.02	Moderate	2.97	Moderate	1.61	2.19
Water Cooling (WC)	5.33	Higher	4.64	Moderate	3.56	2.99
Sediment Retention & Stabilisation (SR)	4.38	Moderate	10.00	Higher	6.03	10.00
Phosphorus Retention (PR)	2.98	Moderate	10.00	Higher	5.66	10.00
Nitrate Removal & Retention (NR)	7.12	Higher	10.00	Higher	6.35	10.00
Carbon Sequestration (CS)	5.11	Moderate			6.69	
Organic Nutrient Export (OE)	7.36	Higher			5.84	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	8.27	Higher	5.01	Higher	5.22	3.55
Aquatic Invertebrate Habitat (INV)	9.53	Higher	9.48	Higher	7.22	6.33
Amphibian & Turtle Habitat (AM)	8.97	Higher	6.22	Higher	8.16	5.54
Waterbird Feeding Habitat (WBF)	10.00	Higher	5.83	Moderate	9.76	5.83
Waterbird Nesting Habitat (WBN)	9.65	Higher	0.00	Lower	7.98	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	8.30	Higher	0.00	Lower	6.87	0.00
Pollinator Habitat (POL)	7.75	Higher	0.00	Lower	6.42	0.00
Native Plant Habitat (PH)	6.62	Higher	5.11	Moderate	6.19	4.43
Public Use & Recognition (PU)			9.20	Higher		6.87
Wetland Sensitivity (Sens)			2.63	Lower		3.01
Wetland Ecological Condition (EC)			4.83	Moderate		6.88
Wetland Stressors (STR) (higher score means more stress)			3.27	Moderate		2.78
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	2.74	Moderate	1.20	Lower	3.69	1.94
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	4.35	Moderate	10.00	Higher	6.44	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	8.18	Higher	7.42	Higher	5.89	5.09
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	10.00	Higher	7.20	Higher	7.99	4.41
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	7.52	Higher	3.02	Lower	6.68	2.95
WETLAND CONDITION (EC)			4.83	Moderate		6.88
WETLAND RISK (average of Sensitivity & Stressors)			1.57	Lower		2.90

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 24, Boat Harbour
Investigator Name:	Christina LaFlamme, Brady Leights
Date of Field Assessment:	24/08/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.659850
Longitude (decimal degrees):	-62.646269
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	0.96
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	24-Aug-17	Site Identifier: WL-24	Investigator: CL, BL	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 0 1 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, PHv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, PHv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. <b>SKIP to OF10.</b>	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[FAV, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, FAV, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	0	
		50 - 100 m	0	
		100 - 500 m	0	
		>500 m	1	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	1	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	0	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	1	
		100 m - 1 km	0	
		1 - 2 km	0	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	0	
		1 - 5 km	1	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC.	1	
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	1	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column.	0.022	[NR, Sens, SFSv, WCv, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). This is the situation for nearly all wetlands in this region.	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope</b> from the AA, and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	1	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	0	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	1	
		0.01 to 0.1	0	
		0.1 to 1	0	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		Other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	1	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	0			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have <b>other fish</b> at least seasonally.	1	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	0	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>amphibian or reptile</b> species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the <b>waterbird</b> species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file.	0	
		Presence of one or more of the nesting <b>songbird or raptor</b> species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying SupplInfo file, during their nesting season (May-July for most species), none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: August 24, 2017		Site Identifier: WL-24		Investigator: CL, BL	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	0	Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale ( <i>Myrica gale</i> ) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]	Fen_
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	1	1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]	Marsh
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	1	Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry ( <i>Morella</i> ), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is <25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	1	[PH, POL, SBM, Sens]	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	1	Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	1	[AM, INV, NR, PH, SBM, Sens]	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	1	Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is:		Exclude temporary "burn piles." [AM, INV, POL, SBM]
		Few or none that meet these criteria.	0	
		Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	1	
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is:		Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
		<1% or none	0	
		1-25% of the vegetated cover, in the AA or along its water edge (whichever has more).	1	
		25-50% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
		>75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0	
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is:		Exclude moss growing on trees and rocks. [CS, PH]
		<5% of the vegetated part of the AA.	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	1	
		>95% of the vegetated part of the AA.	0	
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is:		Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
		Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage.	1	
		Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA.	0	
		Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA.	0	
		Other conditions.	0	
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is:		The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
		Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered).	1	
		Intermediate.	0	
F13	Upland Inclusions	Within the AA, inclusions of upland are:		[AM, NR, SBM]
		Few or none.	0	
		Intermediate (1 - 10% of vegetated part of the AA).	1	
F14	Soil Texture	Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
		In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual).]		
		Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger.	1	
		Peat, to 40 cm depth or greater.	0	
F15	Shorebird Feeding Habitats	Peat or organic <40 cm deep.	0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
		Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0	
		During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA].		
		none, or <100 sq. m.	1	
		100-1000 sq. m.	0	
F16	Herbaceous % of Vegetated Wetland	>10,000 sq. m.	0	[AM, WBF, WBN]
		In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is:		
		<5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover).	0	
		5-25% of the vegetated part of the AA.	0	
		25-50% of the vegetated part of the AA.	0	
F17	Forb Cover	50-95% of the vegetated part of the AA.	0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
		>95% of the vegetated part of the AA.	0	
		Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of:		
		<5% of the herbaceous part of the AA.	0	
		5-25% of the herbaceous part of the AA.	0	
F18	Sedge Cover	25-50% of the herbaceous part of the AA.	0	[CS]
		50-95% of the herbaceous part of the AA.	1	
		>95% of the herbaceous part of the AA.	0	
		Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy:		
		<5% of the vegetated area, or none.	1	
F19	Dominance of Most Abundant Herbaceous Species	5-50% of the vegetated area.	0	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
		50-95% of the vegetated area.	0	
		>95% of the vegetated area.	0	
F20	Invasive Plant Cover	those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year.	1	[EC, PH, POL, Sens]
		those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0	
		How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file.		
		invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals).	1	
		invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody).	0	
F21	Invasive Cover Along Upland Edge	invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody).	0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
		invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody).	0	
		invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	0	
		Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species		
		none of the upland edge (invasives apparently absent), or AA has no upland edge.	1	
F22	Fringe Wetland	some (but <5%) of the upland edge.	0	[WBF, WBN, WCV, ]
		5-50% of the upland edge.	0	
		most (>50%) of the upland edge.	0	
F23	Lacustrine Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	1	[FR, PR, PU, WBF, WBN]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	1	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	1		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	0		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
		99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	0		
		20-50% of the AA.	1		
		50-95% of the AA.	0		
		>95% of the AA. True for many fringe wetlands.	0		AllWet
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	1		
		>75% of the water is shaded.	0		
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	1		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
		>95% of the AA.	0		
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	0		
		10 cm - 50 cm change.	1		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
		>2 m change.	0		
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	0		
		10 - 50 cm deep.	1		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
		>2 m deep. True for many fringe wetlands.	0		
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
		>95% of the water.	1		
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded NoOpenPonded1
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
		100% of the ponded water.	0		AllOpenPond
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in</u> the AA that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
		> 100 m, or open water is absent at that time.	0		
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
		>75% of the water edge.	0		

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
		>75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
		Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		
F38	Persistent Deepwater Area	If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		DeepPersis
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
		Extensive.	0		
F40	Isolated Island	The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: if the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.snb.ca/geonb1/e/DC/catalogue-E.asp">http://w.snb.ca/geonb1/e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	1		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH measurement)	0		
		no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	0		
F43	Outflow Confinement	During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	1		
		is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		
F44	Tributary Channel	At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	1	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	Inflows
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	1		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
		bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
F47	pH Measurement	The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
		was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
F48	TDS and/or Conductivity	The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NRv, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
		Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above	1		
F49	Beaver Probability	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	1		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	0		
F50	Groundwater Strength of Evidence	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
		Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
F51	Internal Gradient	The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than -1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	TooSleep
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
		6-10%	0		
		>10%	0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	0
	>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1	
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	1
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	1
		5-30%	0
		>30%	0
F55	Cliffs or Sleep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	0 Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
	unknown if new or expanded within 20 years or not.	1	
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible <u>in</u> (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	0
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FA, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above].	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	0
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	0 [PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	0 [AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
	trapping of furbearers.	0	
	none of the above.	0	
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplinfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	0 [PH, PR]

BuffAINat

<b>Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1</b>	<b>Data</b>
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S1	<b>Aberrant Timing of Water Inputs</b> <i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i>				
	stormwater from impervious surfaces that drains directly to the wetland				
	water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation				
	regular removal of surface or groundwater for irrigation or other consumptive use				
	flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland				
	a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)				
	excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch				
	artificial drains or ditches in or near the wetland				
	accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)				
	logging within the wetland				
	subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles				
	straightening, ditching, dredging, and/or lining of tributary channels				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of timing shift within the wetland	>95% of wetland	5-95% of wetland	<5% of wetland	0
	When most of the timing shift began	<3 yrs ago	3-9 yrs ago	10-100 yrs ago	0
	<i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i>				
	Input timing now vs. previously	shift of weeks	shift of days	shift of hours or minutes	0
	Flashiness or muting	became very flashy or controlled	intermediate	became mildly flashy or controlled	0
				Sum=	0
				Final Score=	0.00

S2	<b>Accelerated Inputs of Contaminants and/or Salts</b> <i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities				
	metals & chemical wastes from mining, shooting ranges, snow storage areas, oil gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/npr-npri/default.asp?lang=En&amp;nav=B85A1846-1">https://www.ec.gc.ca/npr-npri/default.asp?lang=En&amp;nav=B85A1846-1</a> )				
	road salt				
	spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	cropland, managed landfill, pipeline or transmission rights-of-way	low density residential	0
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
				Sum=	0
				Final Score=	0.00

S3	<b>Accelerated Inputs of Nutrients</b> <i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR]</i>				
	stormwater or wastewater effluent (including failing septic systems), landfills				
	fertilizers applied to lawns, ag lands, or other areas in the CA				
	livestock, dogs				
	artificial drainage of upslope lands				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0s" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Type of loading	high density of unmaintained septic, some types of industrial sources	moderate density septic, cropland, secondary wastewater treatment plant	livestock, pets, low density residential	0
	Frequency & duration of input	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
	AA proximity to main sources (actual or potential)	0 - 15 m	15-100 m or in groundwater	in more distant part of contributing area	0
				Sum=	0
				Final Score=	0.00

S4 Excessive Sediment Loading from Contributing Area				
<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
erosion from construction, in-channel machinery in the CA				
erosion from off-road vehicles in the CA				
erosion from livestock or foot traffic in the CA				
stormwater or wastewater effluent				
sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
accelerated channel downcutting or headcutting of tributaries due to altered land use				
other human-related disturbances within the CA				
<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment				Sum=
				Final Score=
				0.00
S5 Soil or Sediment Alteration Within the Assessment Area				
<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
leveling or other grading not to the natural contour				
tillage, plowing (but excluding disking for enhancement of native plants)				
fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
excavation				
ditch cleaning or dredging in or adjacent to the wetland				
boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
	Severe (3 points)	Medium (2 points)	Mild (1 point)	
Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0
				Sum=
				Final Score=
				0.00

Wetland ID:	WL-24
Date:	8/24/17
Observer:	CL, BL
Latitude & Longitude (decimal degrees):	45.659850 Lat, -62.646269 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	0.41	Lower	0.00	Lower	1.83	0.06
Stream Flow Support (SFS)	3.54	Moderate	2.44	Moderate	1.89	1.80
Water Cooling (WC)	2.79	Moderate	2.83	Moderate	1.86	1.82
Sediment Retention & Stabilisation (SR)	0.00	Lower	10.00	Higher	2.29	10.00
Phosphorus Retention (PR)	1.03	Lower	10.00	Higher	4.45	10.00
Nitrate Removal & Retention (NR)	1.25	Lower	10.00	Higher	4.53	10.00
Carbon Sequestration (CS)	3.41	Lower			5.93	
Organic Nutrient Export (OE)	4.53	Moderate			3.59	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	7.15	Higher	1.99	Moderate	4.51	1.41
Aquatic Invertebrate Habitat (INV)	5.79	Moderate	6.83	Higher	5.62	4.95
Amphibian & Turtle Habitat (AM)	9.22	Higher	3.54	Moderate	8.29	3.73
Waterbird Feeding Habitat (WBF)	6.31	Higher	0.83	Moderate	5.06	0.83
Waterbird Nesting Habitat (WBN)	6.93	Higher	0.00	Lower	5.73	0.00
Songbird, Raptor, & Mammal Habitat (SBM)	7.41	Higher	0.00	Lower	6.13	0.00
Pollinator Habitat (POL)	7.40	Moderate	0.00	Lower	6.13	0.00
Native Plant Habitat (PH)	4.81	Moderate	4.71	Moderate	5.44	4.09
Public Use & Recognition (PU)			1.42	Lower		1.35
Wetland Sensitivity (Sens)			1.95	Lower		2.80
Wetland Ecological Condition (EC)			4.48	Moderate		6.67
Wetland Stressors (STR) (higher score means more stress)			2.09	Lower		2.27
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	0.41	Lower	0.00	Lower	1.83	0.06
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	0.89	Lower	10.00	Higher	5.11	10.00
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	4.77	Moderate	5.31	Moderate	4.43	3.91
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	8.36	Higher	3.35	Moderate	6.50	2.46
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	6.19	Moderate	2.79	Lower	6.02	2.73
WETLAND CONDITION (EC)			4.48	Moderate		6.67
WETLAND RISK (average of Sensitivity & Stressors)			0.00	Lower		2.53

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

Cover Page: Basic Description of Assessment	WESP-AC version 1.2
Site Name:	Wetland 25, Boat Harbour
Investigator Name:	Marina Dulmage, Amanda Facey
Date of Field Assessment:	28/11/2017
Nearest Town:	Pictou Landing, NS
Latitude (decimal degrees):	45.650638
Longitude (decimal degrees):	-62.678142
Is a map based on a formal on-site wetland delineation available?	Yes
Approximate size of the Assessment Area (AA, in acres):	0.14
AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland.	100%
What percent (approx.) of the <b>wetland</b> were you able to visit?	100
What percent (approx.) of the <b>AA</b> were you able to visit?	100
Were you able to ask the site owner/manager about any of the questions?	No
Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals:	Yes
Have you attended a WESP-AC training session? If so, indicate approximate month & year.	Yes, June 2016
How many wetlands have you assessed previously using WESP-AC? (approx.)	30-40
Comments about the site or this WESP-AC assessment (attach extra page if desired):	

Date:	28-Nov-17	Site Identifier: WL-25	Investigator: MD, AF	
<p><b>Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 1.2.1 for New Brunswick wetlands only.</b> DIRECTIONS: Conduct an assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers:          Google Earth Pro: <a href="https://www.google.com/earth/download/gep/agree.html">https://www.google.com/earth/download/gep/agree.html</a>          GeoNB: <a href="http://www.snb.ca/geonb1/">http://www.snb.ca/geonb1/</a> and <a href="http://www.snb.ca/geonb1/e/apps/apps-E.asp">http://www.snb.ca/geonb1/e/apps/apps-E.asp</a>          For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>				
#	Indicators	Condition Choices	Data	Definitions/Explanations
OF1	Province	Mark the province in which the AA is located by changing the 0 in the column next to it to a "1". Mark only one. New Brunswick Nova Scotia Prince Edward Island Newfoundland-Labrador	0 1 0 0	This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province.
OF2	Ponded Area Within 1 km.	The area of <b>surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	"Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km, include only the part within 1 km. Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in pop-up menu). With the GeoNB viewer, enable the Wetlands layer, then measure with the Draw & Measure tool after specifying Aerial as the Basemap. However, do not rely entirely on wetland boundaries shown in online wetlands layers. [PH, SBM, WBN]
OF3	Ponded Water & Wetland Within 1 km	The area of <b>wetlands and surface water</b> ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares >100 hectares	0 0 0 1 0 0	See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km, include only the part within 1 km. "Ponded" means not flowing in rivers or streams. [Sens, WBF]
OF4	Size of Largest Nearby Vegetated Tract or Corridor	The largest vegetated patch or corridor that includes the AA's vegetation plus all <b>adjacent</b> upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: <0.01 hectare (about 10 m x 10 m) 0.01 - 0.1 hectare 0.1 - 1 hectare 1 to 10 hectares 10 to 100 hectares 100 to 1000 hectares >1000 hectares [This is nearly always the answer in relatively undeveloped landscapes.]	0 0 0 0 1 0 0	See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens]
OF5	Distance to Large Vegetated Tract	The minimum distance from the edge of the AA to the edge of the closest <b>vegetated land</b> (but excluding row crops, lawn, conifer plantation) <b>larger than 375 hectares</b> (about 2 km on a side), is: <50 m, and not separated completely from the 375-ha vegetated area by any width of paved road, stretches of open water, row crops, lawn, or impervious surface. Or the AA itself contains >375 ha of vegetation. [This is often the answer in relatively undeveloped landscapes]. <50 m, but completely separated from the 375-ha vegetated area by those features, and AA does not contain >375 ha of vegetation. 50-500 m, and <b>not</b> separated. 50-500 m, but separated by those features. 0.5 - 5 km, and <b>not</b> separated. 0.5 - 5 km, but separated by those features. none of the above (the closest patches or corridors which are that large are >5 km away).	0 0 1 0 0 0	To measure distance, use Google Earth Pro (Ruler > Line tool). Or use Draw & Measure tool at GeoNB. The 375-ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens]
OF6	Herbaceous Uniqueness	The AA's vegetation cover is >10% herbaceous but uplands within 5 km have <10% herbaceous cover. If so, enter "3" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 1 km have <10% herbaceous cover. If so enter "2" and continue to OF7. If not, consider: The AA's vegetation cover is >10% herbaceous but uplands within 100 m of the wetland edge have <10% herbaceous cover. If so, enter "1". [* NOTE: Exclude lawns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation"]	0	For this question only, consider moss to be herbaceous vegetation. Determine the score by viewing aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of 5 km, 1 km, and 100 m radius focused on the center of the AA. Circles of specified radius can be drawn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMv, Phv, POLv, SBMv, WBFv, WBNv]
OF7	Woody Uniqueness	The AA's vegetation cover is >10% woody but uplands within 5 km have <10% woody cover. If so, enter "3" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 1 km have <10% woody cover. If so enter "2" and continue to OF8. If not, consider: The AA's vegetation is >10% woody but uplands within 100 m of the wetland edge have <10% woody cover. If so, enter "1". [*NOTE: woody cover = trees & shrubs taller than 1 m]	0	See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMv, Phv, POLv, SBMv]
OF8	Local Vegetated Cover Percentage	Draw a 5-km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining area that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: <5% of the land. 5 to 20% of the land. 20 to 60% of the land. 60 to 90% of the land. >90% of the land. SKIP to OF10.	0 0 0 1 0	In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens]

OF9	Type of Land Cover Alteration	Within the 5-km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly:		[AM, SBM]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0	
		bare pervious surface, e.g., lawn, recent (<5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation.	1	
OF10	Distance by Road to Nearest Population Center	Measured along the maintained road nearest the AA, the distance to the nearest population center is:		"Population center" means a settled area with more than about 5 regularly-inhabited structures per square kilometer. In Google Earth, click on the Ruler icon, then Path, and draw and measure the route. Or use the GeoNB's Draw & Measure tool> Freehand Line to draw and measure the route to Settlements (click on Place Names in menu) or other areas not close to mapped settlements but which meet the criteria.[Fav, FRv, NRv, PH, PU, SBM, WBFv]
		<100 m	0	
		100 - 500 m	0	
		0.5 - 1 km	0	
		1 - 5 km	1	
>5 km	0			
OF11	Distance to Nearest Maintained Road	From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is:		Determine this by viewing aerial imagery in Google Earth and measuring with the Ruler>Line tool. Or use the GeoNB's Draw Line tool. [AM, Fav, FRv, NRv, PH, PU, SBM, STR, WBN]
		<10 m	0	
		10 - 25 m	0	
		25 - 50 m	1	
		50 - 100 m	0	
		100 - 500 m	0	
		>500 m	0	
OF12	Wildlife Access	Draw a circle of radius of 5 km from the center of the AA. If mammals and amphibians can move from the center of the AA to ALL other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark 1= yes can move to all, 0= no. Change to blank if there are no other wetlands within 5 km.	0	In NB, enable the Wetlands layer in GeoNB (despite its omissions) to show surrounding wetlands and roads, while estimating the location of the 5 km circle (or draw the 5 km circle in Google Earth Pro using the Circle tool and compare). Evaluate using Google Earth, being cautious to search for roads hidden under forest canopy. [AM, SBM, STR]
OF13	Distance to Poned Water	The distance from the AA center to the closest (but separate) ponded water body visible in GoogleEarth imagery is:		In Google Earth, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. Enable the GeoNB viewer's Wetlands layer as well. [AM, PH, SBM, Sens, WBF, WBN]
		<50 m, and not separated completely by any width of paved road, stretches of open water, row crops, lawn, bare ground, or impervious surface.	0	
		<50 m, but completely separated from the ponded water by those features.	0	
		50-500 m, and not separated.	0	
		50-500 m, but separated by those features.	0	
		0.5 - 1 km, and not separated.	0	
		0.5 - 1 km, but separated by those features.	1	
none of the above (the closest patches or corridors that large are >1 km away).	0			
OF14	Distance to Large Poned Water	The distance from the AA center to the closest (but separate) non-tidal body of water that is ponded during most of the year and is larger than 8 hectares is:		Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN]
		<100 m	0	
		100 m - 1 km	0	
		1 - 2 km	1	
		2-5 km	0	
		5-10 km	0	
>10 km	0			
OF15	Tidal Proximity	The distance from the AA edge to the closest tidal water body (regardless of its salinity) is:		In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KMZ file provided with this calculator for NB (NB Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF]
		<100 m	0	
		100 m - 1 km	1	
		1 - 5 km	0	
		5-10 km	0	
		10-40 km	0	
>40 km	0			
OF16	Upland Edge Contact	Select one:		[NR, SBM, Sens]
		The AA has no upland edge (or upland is <1% of perimeter). The AA is entirely surrounded by (& contiguous with) other wetlands or water.	0	
		1-25% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		25-50% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
		50-75% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA.	0	
More than 75% of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. <b>This will be true for most assessments done with WESP-AC.</b>	1			
OF17	Flood Damage from Non-tidal Waters	Within 5 km downstream or downslope of the AA (select first true choice):		In the GeoNB map viewer: click on "More" in upper right, then "Flood Information". Expand the menu under it by clicking on the arrow to its left and the slider to its right. Uncheck the first (Limits of Data) box. Where available, LIDAR imagery can provide finer elevational resolution useful for flood modeling. [WSv]
		Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges.	0	
		Maps show Flood Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
		Maps do not show Flood Zone or Flood Risk areas (or no such mapping has been done locally) and there is no infrastructure vulnerable to river flooding unrelated to tidal storm surges.	0	
OF18	Relative Elevation in Watershed	In Google Earth, enable the Terrain layer (lower left menu) and open the NB Watersheds KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min) and enter the result in the next column.	0.377	[NR, Sens, SFSv, WCv, WSV]
OF19	Water Quality Sensitive Watershed or Area	In Google Earth, open the KMZ file NB_Watershed Protected Area which accompanies this calculator. The AA is within such an area. Enter 1= yes, 0= no.	0	If an ACCDC report is available for this AA, it also may contain such information. [NRv]
OF20	Degraded Water Upstream	Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and:		May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRv, PRv, SRv, STR, WBF, WBN]
		The condition is present within the AA.	0	
		The condition is present in waters within 1 km that flow into the AA, but has not been documented in the AA itself.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	

OF21	Degraded Water Downstream	The problem described above is <b>downslope from the AA</b> , and:		May use existing data, or monitor waters as part of this wetland assessment. [NRv, PRv, SRv]
		The condition is present within 1 km downslope and connected to the AA by a channel.	0	
		The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel.	0	
		Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters.	0	
		Data are insufficient (no or inadequate sampling within 1 km, or condition exists only at >1 km upstream). <b>This is the situation for nearly all wetlands in this region.</b>	1	
OF22	Wetland as a % of Its Contributing Area (Catchment)	From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the AA) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland's area. The result is:		[NR, PR, Sens, SR, WS]
		<0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area.	0	
		0.01 to 0.1	0	
		0.1 to 1	1	
		>1 (wetland is larger than its catchment (e.g., wetland with flat surrounding terrain and no inlet, or is entirely isolated by dikes, or is a raised bog).	0	
OF23	Unvegetated Surface in the Contributing Area	The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots, other pavement, exposed bedrock, landslides, and other mostly-bare surface is about :		[FA, INV, NRv, PRv, SRv, STR, WCV, WSV, ]
		<10%	1	
		10 to 25%	0	
		>25%	0	
OF24	Transport From Upslope	A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: (a) input channel is present, (b) input channels have been straightened, (c) upslope wetlands have been ditched extensively, (d) land cover is mostly non-forest, (e) CA slopes are steep, and/or (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. This statement is:		[NRv, PRv, SRv, WSV]
		Mostly true	0	
		Somewhat true	0	
		Mostly untrue	1	
OF25	Aspect	The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is:		[AM, NR, SFS, WC, WS, ]
		Northward (N, NE), north-facing contributing area.	0	
		Southward (S, SW), south-facing contributing area.	0	
		other (E, SE, W, NW), or no detectable uphill slope or input channel (flat).	1	
OF26	Internal Flow Distance (Path Length)	The horizontal flow distance from the wetland's inlet to outlet is:		Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova Scotia Topo as the Basemap. Also enable the layer Forestry-WAM Predicted Flow. Then measure the inlet-outlet distance. [NR, OE, PR, SR, WS]
		<10 m	0	
		10 - 50 m	0	
		50 - 100 m	0	
		100 - 1000 m	0	
		1- 2 km	0	
>2 km, or wetland lacks an inlet and/or outlet.	1			
OF27	Growing Degree Days	In Google Earth, open the KMZ file that accompanies this calculator, called NB-PEI_GrowingDegreeDays or NS_GrowingDegreeDays. Place your mouse over the AA and left-click. A pop-up shows a "Grid Code" number which is the Growing Degree Days (GDD). Enter that number in the next column.	2392	This layer was provided by Dr. Dan McKenney of the Canadian Forest Service. [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS]
OF28	Fish Access or Use	According to agency biologists and/or your own observations, the AA: <i>[mark just the first choice that is true]</i> :		Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. In NB, the list of stocked waters is at: <a href="http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html">http://www2.gnb.ca/content/gnb/en/departments/erd/natural_resources/content/fish/content/StockedWaters.html</a> [AM, FA, FR, INV, WBF, WBN]
		is known to support rearing and/or spawning by Atlantic salmon or other anadromous species. In NB, consult Figure A-2 in Appendix A of the Manual. In all provinces, contact local fishery biologists, review the ACCDC report, and visit these websites: <a href="http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html">http://www.salmonatlas.com/atlanticsalmon/canada-east/index.1.html</a>	0	
		has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species and is probably accessed by those during some conditions.	0	
		is probably not accessed by any anadromous fish species but is known or likely to have other fish at least seasonally.	0	
		is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked).	1	
OF29	Species of Conservation Concern	Within the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented <i>[mark all applicable]</i> :		Request information from ACCDC and/or conduct your own survey at an appropriate season using an approved protocol. For birds, also check eBird.org. [AMv, EC, PHv, POLv, SBMv, Sens, WBFv, WBNv]
		Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the amphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the waterbird species (WBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file.	0	
		Presence of one or more of the nesting songbird or raptor species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file, during their nesting season (May-July for most species).	0	
		none of the above, or no data.	1	
OF30	Important Bird Area (IBA)	In Google Earth, open the KMZ file that accompanies this calculator, called IBAs_Canada. The AA is all or part of an officially designated IBA. Enter 1= yes, 0= no.	0	The source of this layer, which should be checked periodically for updates, is: <a href="http://www.ibacanada.com/mapviewer.jsp?lang=EN">http://www.ibacanada.com/mapviewer.jsp?lang=EN</a> [SBMv, WBFv, WBNv]
OF31	Black Duck Nesting Area	In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per 25 sq. km) of nesting American Black Duck in the AA's vicinity: <10 (enter 0), 10-20 (enter 1), 20-30 (enter 2), >30 (enter 3). If outside of region shown in map, change to blank.	0	This was provided by Dr. David Leske. [WBNv]
OF32	Wintering Deer or Moose Concentration Areas	If AA is on private land with no information, change to blank (not 0). If on public/crown land, in Google Earth open the KMZ file that accompanies this report called NB_DeerWinteringAreas. Otherwise: Enter: yes= 1, no= 0.	0	[SBM]
OF33	Other Conservation Designation	With GeoNB, click on Candidate PNA Map Viewer to identify Provincially Significant Wetland, Environmentally Significant Area, Protected Natural Area -- but also include if the AA is all or part of an area designated by government, First Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. Enter: yes= 1, no= 0. Enter: yes= 1, no= 0. If uncertain, consult NCC and agencies for more recent information.	0	See: <a href="https://novascotia.ca/parksandprotectedareas/plan/interactive-map/">https://novascotia.ca/parksandprotectedareas/plan/interactive-map/</a> [PU]

OF34	Conservation Investment	The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank (not 0).	0	[PU]
OF35	Mitigation Investment	The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to <b>blank</b> .		[PU]
OF36	Sustained Scientific Use	Plants, animals, or water in the AA have been monitored for >2 years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes= 1, no= 0. If no information, change to blank.		[PU]
OF37	Calcareous Region	The AA is in an area that is underlain at least partly by soil, sediment, or bedrock that is calcareous or carbonate. Limestone is often a major component and water is not acidic (pH is usually >8). See Figure A-6 in Appendix A of the Manual. Enter: yes= 1, no= 0. If no information, change to blank.	0	[AM, FA, FR, INV, OE, PH]
OF38	Ownership	Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NB Crown lands.		*Private lands* may include those owned or leased by non-governmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR]
		New timber harvest, roads, mineral extraction, and intensive summer recreation (e.g., off-road vehicles) are permanently prohibited. Includes many publicly-owned Protected Lands, and private lands under long-term (30+ year) legal agreements to maintain nearly-unaltered conditions.	0	
		ownership is public (e.g., municipal, Crown Reservations/Notations) but some or all of the above activities are allowed.	0	
		ownership is private but public access is allowed, and/or a shorter-term conservation easement (whether renewable or not) is in place.	0	
		ownership is private and owner does not allow access, or access permission unknown, and not a conservation easement.	1	

Date: 11/28/2017		Site Identifier: WL-25		Investigator: MLD, ANF	
<p><b>Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 1.2.1. DIRECTIONS:</b> Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgeable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage &amp; Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention &amp; Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian &amp; Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, &amp; Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use &amp; Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors.</p>					
#	Indicators	Condition Choices	Data	Definitions/Explanations	Cell Name
F1	Wetland Type	<p>Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA:</p> <p><b>A.</b> Moss and/or lichen cover <b>more than 25%</b> of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> Surface water is usually absent or, if present, pH is typically &lt;4.5 and conductivity is usually &lt;100 µS/cm (&lt;64 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (<i>Carex rariflora</i>). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is &lt;4.0.</p> <p><b>A2.</b> Not A1. Surface water, if present, has pH typically &gt;4.5 and conductivity is usually &gt;100 µS/cm (&gt;64 ppm TDS). Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower (&lt;2 m).</p> <p><b>B.</b> Moss and/or lichen cover <b>less than 25%</b> of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column:</p> <p><b>B1.</b> Trees and shrubs taller than 1 m comprise <b>more than 25%</b> of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain).</p> <p><b>B2.</b> Not B1. Tree &amp; tall shrubs comprise <b>less than 25%</b> of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely.</p>	<p>0</p> <p>0</p> <p>1</p> <p>0</p>	<p>Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Although not in the family Ericaceae, sweetgale (<i>Myrica gale</i>) should be counted also. [AM, CS, FA, FR, INV, NR, OE, PH, Sens, SFS, WBF, WBN]</p>	<p>Fen_</p> <p>Marsh</p>
<p><b>Reminder:</b> For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares (~283 m on a side) that are adjacent to the AA. The AA should also include part of the water area of adjacent lakes larger than 8 ha and adjacent rivers wider than 20 m. Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent" is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent.</p>					
F2	Wetland Types - Adjoining or Subordinate	<p>If the AA is smaller than 1 ha, mark all other types that occupy more than 1% of the vegetated AA. If the AA is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1.</p> <p>A1</p> <p>A2</p> <p>B1</p> <p>B2</p>	<p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, INV, SBM, WBF]</p>	
F3	Woody Height & Form Diversity	<p>Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature (6 if &gt;95%, 5 if 75-95%, 4 if 50-75%, 3 if 25-50%, 2 if 5-25%, 1 if &lt;5%, 0 if none). If the vegetated part of the AA is largely herbaceous (non-woody) vegetation, these percentages should not sum to 100%.</p> <p>coniferous trees (may include tamarack) taller than 3 m.</p> <p>deciduous trees taller than 3 m.</p> <p>coniferous or ericaceous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees.</p> <p>coniferous or ericaceous shrubs &lt;1 m tall not directly below the canopy of taller vegetation.</p> <p>deciduous shrubs or trees &lt;1 m tall (e.g., deciduous seedlings) not directly below the canopy of taller vegetation.</p>	<p>0</p> <p>2</p> <p>0</p> <p>2</p> <p>0</p> <p>2</p>	<p>Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (<i>Morella</i>), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is &lt;25% moss, then question F1 might be "B1". [CS, INV, NR, PH, POL, SBM, Sens]</p>	
<p><b>Note:</b> If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers).</p>					
F4	Dominance of Most Abundant Shrub Species	<p>Determine which two woody plant species comprise the greatest portion of the low (&lt;3 m) woody cover. Then choose one:</p> <p>those species together comprise &gt; 50% of such cover.</p> <p>those species together do not comprise &gt; 50% of such cover.</p>	<p>0</p> <p>1</p>	<p>[PH, POL, SBM, Sens]</p>	
F5	Woody Diameter Classes	<p>Mark ALL the types that comprise &gt;5% of the woody canopy cover in the AA or &gt;5% of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA.</p> <p>coniferous, 1-9 cm diameter and &gt;1 m tall.</p> <p>broad-leaved deciduous 1-9 cm diameter and &gt;1 m tall.</p> <p>coniferous, 10-19 cm diameter.</p> <p>broad-leaved deciduous 10-19 cm diameter.</p> <p>coniferous, 20-40 cm diameter.</p> <p>broad-leaved deciduous 20-40 cm diameter.</p> <p>coniferous, &gt;40 cm diameter.</p> <p>broad-leaved deciduous &gt;40 cm diameter.</p>	<p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN]</p>	
F6	Height Class Interspersion	<p>Follow the key below and mark the ONE row that best describes MOST of the AA:</p> <p><b>A.</b> Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise &gt;70% of the vegetated part of the AA. They each comprise 30-70%. Choose between A1 and A2 and mark the choice with a 1 in the adjoining column. Otherwise go to B below.</p> <p><b>A1.</b> The two height classes are mostly scattered and intermixed throughout the AA.</p> <p><b>A2.</b> Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps.</p> <p><b>B.</b> Either the vegetation shorter than 1 m comprises &gt;70% of the vegetated part of the AA, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column:</p> <p><b>B1.</b> The less prevalent height class is mostly scattered and intermixed within the prevalent one.</p> <p><b>B2.</b> Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent.</p>	<p>0</p> <p>1</p> <p>0</p> <p>0</p>	<p>[AM, INV, NR, PH, SBM, Sens]</p>	
F7	Large Snags (Dead Standing Trees)	<p>The number of large snags (diameter &gt;20 cm) in the AA plus adjacent upland area within 10 m of the wetland edge is:</p> <p>None, or fewer than 8/hectare which exceed this diameter.</p> <p>Several (&gt;8/hectare) and a pond, lake, or slow-flowing water wider than 10 m is within 1 km.</p> <p>Several (&gt;8/hectare) but above not true.</p>	<p>1</p> <p>0</p> <p>0</p>	<p>Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN]</p>	

F8	Downed Wood	The number of downed wood pieces longer than 2 m and with diameter >10 cm, and not persistently submerged, is: Few or none that meet these criteria. Several (>5 if AA is >5 hectares, less for smaller AAs) meet these criteria.	0 1	Exclude temporary "burn piles." [AM, INV, POL, SBM]
F9	N Fixers	The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: <1% or none 1-25% of the vegetated cover, in the AA or along its water edge (whichever has more). 25-50% of the vegetated cover, in the AA or along its water edge (whichever has more). 50-75% of the vegetated cover, in the AA or along its water edge (whichever has more). >75% of the vegetated cover, in the AA or along its water edge (whichever has more).	0 1 0 0 0	Do not include N-fixing algae or lichens. [FA, FR, INV, NRv, OE, PH, SBM, Sens]
F10	Sphagnum Moss Extent	The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: <5% of the vegetated part of the AA. 5-25% of the vegetated part of the AA. 25-50% of the vegetated part of the AA. 50-95% of the vegetated part of the AA. >95% of the vegetated part of the AA.	1 0 0 0 0	Exclude moss growing on trees and rocks. [CS, PH]
F11	% Bare Ground & Thatch	Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is: Little or no (<5%) bare ground is visible between erect stems or under canopy anywhere in the vegetated AA. Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage. Slightly bare ground (5-20% bare between plants) is visible in places, but those areas comprise less than 5% of the unflooded parts of the AA. Much bare ground (20-50% bare between plants) is visible in places, and those areas comprise more than 5% of the unflooded parts of the AA. Other conditions. Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time.	0 0 1 0 0	Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR, SBM, Sens]
F12	Ground Irregularity	Imagine the AA without any living vegetation. Excluding the portion of the AA that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed >10 cm compared to most of the area within a few meters surrounding them is: Few or none (minimal microtopography: <1% of the land has such features, or entire AA is always water-covered). Intermediate. Several (extensive micro-topography).	1 0 0	The depressions may be of human or natural origin. [AM, EC, INV, NR, PH, POL, PR, SBM, SR, WS]
F13	Upland Inclusions	Within the AA, inclusions of upland are: Few or none. Intermediate (1 - 10% of vegetated part of the AA). Many (e.g., wetland-upland "mosaic", >10% of the vegetated AA).	1 0 0	[AM, NR, SBM]
F14	Soil Texture	In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly: [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (Figure A-7 in the Manual.)] Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger. Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and Peat, to 40 cm depth or greater. Peat or organic <40 cm deep. Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger.	0 0 0 1 0	[CS, NR, OE, PH, PR, Sens, SFS, WS]
F15	Shorebird Feeding Habitats	During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [include also any area that is adjacent to the AA]. none, or <100 sq. m. 100-1000 sq. m. 1000 - 10,000 sq. m. >10,000 sq. m.	1 0 0 0	This addresses needs of many but not all migratory sandpipers, plovers, and related species. [WBF]
F16	Herbaceous % of Vegetated Wetland	In aerial ("ducks eye") view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is: <5% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here and SKIP to F20 (Invasive Plant Cover). 5-25% of the vegetated part of the AA. 25-50% of the vegetated part of the AA. 50-95% of the vegetated part of the AA. >95% of the vegetated part of the AA.	0 1 0 0 0	[AM, WBF, WBN]
F17	Forb Cover	Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of: <5% of the herbaceous part of the AA. 5-25% of the herbaceous part of the AA. 25-50% of the herbaceous part of the AA. 50-95% of the herbaceous part of the AA. >95% of the herbaceous part of the AA.	1 0 0 0 0	Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferns, horsetails, or others that lack showy flowers. [POL]
F18	Sedge Cover	Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy: <5% of the vegetated area, or none. 5-50% of the vegetated area. 50-95% of the vegetated area. >95% of the vegetated area.	1 0 0 0	[CS]
F19	Dominance of Most Abundant Herbaceous Species	Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: those species together comprise > 50% of the areal cover of herbaceous plants at any time during the year. those species together do not comprise > 50% of the areal cover of herbaceous plants at any time during the year.	0 1	For this question, include ferns as well as graminoids and forbs. [EC, INV, PH, POL, Sens]
F20	Invasive Plant Cover	How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplinfo file. invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals). invasive species are present in more than trace amounts, but comprise <5% of herbaceous cover (or woody cover, if the invasives are woody). invasive species comprise 5-20% of the herb cover (or woody cover, if the invasives are woody). invasive species comprise 20-50% of the herb cover (or woody cover, if the invasives are woody). invasive species comprise >50% of the herb cover (or woody cover, if the invasives are woody).	1 0 0 0 0	[EC, PH, POL, Sens]
F21	Invasive Cover Along Upland Edge	Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species none of the upland edge (invasives apparently absent), or AA has no upland edge. some (but <5%) of the upland edge. 5-50% of the upland edge. most (>50%) of the upland edge.	1 0 0 0	If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR]
F22	Fringe Wetland	During most of the year, open water within or adjacent to the vegetated AA (in a lake, stream, or river) is much wider than the vegetated wetland. Enter "1" if true, "0" if false.	0	[WBF, WBN, WCV, ]
F23	Lacustrine Wetland	The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year.	0	[FR, PR, PU, WBF, WBN]

NoHerbCov

AllForbCov

F24	% of AA Without Surface Water	The percentage of the AA that <u>never</u> contains surface water during an average year (that is, except perhaps for a few hours after snowmelt or rainstorms), but which is still a wetland, is:		1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of 100 m by 100 m, 1000 m by 10 m, or similar. [AM, FA, FR, INV, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC]	
		<1% . In other words, all or nearly all of the AA is covered by water permanently or at least seasonally.	0		
		1-25% of the AA, or <1% but >0.01 ha never contains surface water.	0		
		25-50% of the AA never contains surface water.	0		
		50-75% of the AA never contains surface water.	1		
		75-99% of the AA never contains surface water, or >99% AND there is at least one persistently ponded water body larger than 1 ha in the AA.	0		
	99-100%. AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" and SKIP to F42 (Channel Connection).	0		AllSat2 AllSat1	
F25	% of AA with Persistent Surface Water	Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is:		If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN]	NoPersis
		none. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27.	0		
		1-20% of the AA.	1		
		20-50% of the AA.	0		
		50-95% of the AA.	0		
	>95% of the AA. True for many fringe wetlands.	0		AllWet	
F26	% of Summertime Water that Is Shaded	At mid-day during the warmest time of year, the area of surface water <u>within</u> the AA that is shaded by vegetation and other features that are <u>within</u> the AA at that time is:		[FA, WC]	
		<5% of the water is shaded, or no surface water is present then.	0		
		5-25% of the water is shaded.	0		
		25-50% of the water is shaded.	0		
		50-75% of the water is shaded.	0		
	>75% of the water is shaded.	1			
F27	% of AA that is Flooded Only Seasonally	The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is:		Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Also, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS]	NoSeasonal
		None, or <0.01 hectare and <1% of the AA. SKIP to F29.	0		
		1-20% of the AA, or <1% but >0.01 ha.	0		
		20-50% of the AA.	0		
		50-95% of the AA.	1		
	>95% of the AA.	0			
F28	Annual Water Fluctuation Range	The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is:		Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS]	
		<10 cm change (stable or nearly so).	1		
		10 cm - 50 cm change.	0		
		0.5 - 1 m change.	0		
		1-2 m change.	0		
	>2 m change.	0		TooSmall	
Is the AA plus adjacent ponded water smaller than 0.01 hectare (about 10m x 10m, or 1m x 100 m)? If so, enter "1" in column D and SKIP TO F42 (Connection).			0		TooSmall
F29	Predominant Depth Class	During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is:		If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation is most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC, ]	
		<10 cm deep (but >0).	1		
		10 - 50 cm deep.	0		
		0.5 - 1 m deep.	0		
		1 - 2 m deep.	0		
	>2 m deep. True for many fringe wetlands.	0			
F30	Depth Classes - Evenness of Proportions	When present, surface water in most of the AA usually consists of (select one):		Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN]	
		One depth class that comprises >90% of the AA's inundated area (use the classes in the question above).	1		
		One depth class that comprises 50-90% of the AA's inundated area.	0		
		Neither of above. There are 3 or more depth classes and none occupy >50%.	0		
F31	% of Water That Is Ponded (not Flowing)	During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is:		Nearly all wetlands with surface water have some ponded water. [AM, CS, INV, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS]	NoPonded
		<5% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34.	0		
		5-30% of the water.	0		
		30-70% of the water.	0		
		70-95% of the water.	0		
	>95% of the water.	1			
F32	Ponded Open Water - Minimum Size	During most of the growing season, the largest patch of open water that is ponded and is in or bordering the AA is >0.01 hectare (about 10 m by 10 m) and mostly deeper than 0.5 m. If true enter "1" and continue, if false, enter "0" and SKIP to F41 (Floating Algae & Duckweed).	0	Open water is not obscured by vegetation in aerial ("duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it.	OpenW
F33	% of Ponded Water that is Open	In ducks-eye aerial view, the percentage of the ponded water that is open (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is:		[AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC, ]	NoOpenPonded
		None, or <1% of the AA and largest pool occupies <0.01 hectares. Enter "1" and SKIP to F41 (Floating Algae & Duckweed).	0		NoOpenPonded1
		1-4% of the ponded water. Enter "1" and SKIP to F40 (Floating Algae & Duckweed).	0		
		5-30% of the ponded water.	0		
		30-70% of the ponded water.	0		
		70-99% of the ponded water.	0		
	100% of the ponded water.	0		AllOpenPond	
F34	Width of Vegetated Zone within Wetland	At the time during the growing season when the AA's water level is lowest, the average width of vegetated area <u>in the AA</u> that separates adjoining uplands from open water within the AA is:		"Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Width may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN]	
		<1 m	0		
		1 - 9 m	0		
		10 - 29 m	0		
		30 - 49 m	0		
		50 - 100 m	0		
	>100 m, or open water is absent at that time.	0			
F35	Flat Shoreline Extent	During most of the part of the growing season when water is present, the percentage of the AA's water edge length that is nearly flat (a slope less than about 5% measured within 5 m landward of the water) is:		If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN]	
		<1% of the water edge.	0		
		1-25% of the water edge.	0		
		25-50% of the water edge.	0		
		50-75% of the water edge.	0		
	>75% of the water edge.	0			

F36	Robust Emergents	The percentage of the emergent vegetation cover in the AA that is cattail ( <i>Typha</i> spp.), common reed ( <i>Phragmites</i> ), or tall (>1m) bulrush is:		Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN]	NoRobustEm
		<1% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38.	0		
		1-25% of the emergent vegetation.	0		
		25-75% of the emergent vegetation.	0		
F37	Interspersion of Emergents & Open Water	During most of the part of the growing season when water is present, the spatial pattern of emergent vegetation within the water is mostly:		[AM, FA, FR, INV, NR, OE, PH, PR, SBM, SR, WBF, WBN]	
		Scattered. More than 30% of such vegetation forms small islands or corridors surrounded by water.	0		
		Intermediate.	0		
F38	Persistent Deepwater Area	Clumped. More than 70% of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area.	0		DeepPersis
		If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the AA is mostly deeper than 0.5 m for >2 weeks during the growing season, enter "1" and continue. If not, enter "0" and SKIP to F42.(Connection).	0		
F39	Non-vegetated Aquatic Cover	During most of the growing season and in waters deeper than 0.5 m, the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is:		For this question, consider only the wood that is at or above the water surface. Estimates of underwater wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, INV]	
		Little or none.	0		
		Intermediate.	0		
F40	Isolated Island	Extensive.	0		
		The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shore by water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a	0	[WBN]	
F41	Floating Algae & Duckweed	At some time of the year, mats of algae and/or duckweed are likely to cover >50% of the AA's otherwise-unshaded water surface, or blanket >50% of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter "0".	0	[EC, PR, WBF]	
F42	Channel Connection & Outflow Duration	The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is the least permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.]		Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA, consult topographic maps perhaps by viewing these online with Toporama ( <a href="http://atlas.nrcan.gc.ca/toporama/en/index.html">http://atlas.nrcan.gc.ca/toporama/en/index.html</a> ), or use GIS to view streams after downloading the NB Hydrographic Networkshapfiles from <a href="http://w.smb.ca/geon11e/DC/catalogue-E.asp">http://w.smb.ca/geon11e/DC/catalogue-E.asp</a> [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS]	OutNone1 Outnone
		persistent (surface water flows out for >9 months/year).	0		
		seasonal (surface water flows out for 14 days to 9 months/year, not necessarily consecutive).	0		
		temporary (surface water flows out for <14 days, not necessarily consecutive).	0		
		none -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH measurement)	0		
F43	Outflow Confinement	no surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement).	1		
		During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water:		"Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS]	
		mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season.	0		
		leaves through natural exits (channels or diffuse outflow), not mainly through artificial or temporary features.	0		
F44	Tributary Channel	is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA.	0		Inflows
		At least once annually, surface water from a tributary channel that is >100 m long moves into the AA. Or, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement).	0	If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv]	
			0		
F45	Input Water Temperature	Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the AA during part of most years. Enter 1= yes, 0= no.	0	[WCV]	
F46	Throughflow Resistance	During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered by most of the incoming water].		[FA, FR, INV, NR, OE, PR, SR, WS]	
		Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake.	0		
		bumps into herbaceous vegetation but mostly remains in fairly straight channels.	0		
		bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels.	0		
		bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels.	0		
F47	pH Measurement	bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided).	0		
		The pH in most of the AA's surface water:		Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, PH, PR, Sens, WBN]	
		was measured, and is: [enter the reading in the column to the right]:			
F48	TDS and/or Conductivity	was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1".	0		
		neither of above. Enter "1".	1		
		The TDS (total dissolved solids) or conductivity of the AA's surface water is: (select the first true row with information):		See above for measurement guidance. [FR, INV, NR, PH, PRv, Sens]	
		TDS is: [enter the reading in ppm or mg/L in the column to the right, if measured, or answer next row]:			
F49	Beaver Probability	Conductivity is: [enter the reading in µS/cm in the column to the right]:			
		was not measured, but plants that indicate saline conditions cover much of the vegetated AA. Enter "1".	0		
		neither of above.	1		
F50	Groundwater Strength of Evidence	Use of the AA by beaver during the past 5 years is (select most applicable ONE):		[FA, FR, PH, SBM, Sens, WBF, WBN]	
		evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags).	0		
		likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient (<10%) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water.	0		
		unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed.	1		
F51	Internal Gradient	Select first applicable choice.		Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH, or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INV, NR, OE, PH, PRv, SFS, WC, WS, ]	
		Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater.	0		
		Most of the AA has a slope of >5%, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is >5.5.	0		
F51	Internal Gradient	Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown.	1		
		The gradient along most of the flow path within the AA is:		This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than -1 km), this may be estimated using Google Earth to determine the minimum and maximum elevation within the AA, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS]	
		<2% or the AA has no surface water outlet (not even seasonally)	1		
		2-5%	0		
F51	Internal Gradient	6-10%	0		
		>10%	0		
			0		

Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images.			
F52	Vegetated Buffer as % of Perimeter	Within a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that contains perennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is:	[AM, FA, FR, INV, NRv, PH, POL, PRv, SBM, Sens, SRv, STR, WBN]
		<5%	0
		5 to 30%	0
		30 to 60%	0
		60 to 90%	0
		>90%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55.	1
F53	Type of Cover in Buffer	Within 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE):	[AM, FA, INV, NRv, PH, POL, SBM, STR, WBN]
		impervious surface, e.g., paved road, parking lot, building, exposed rock.	0
		bare or nearly bare pervious surface or managed vegetation, e.g., lawn, row crops, unpaved road, dike, landslide.	0
F54	Buffer Slope	The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies >10% of that upland area has a percent slope of:	[NRv, PRv, Sens, SRv]
		<1% (flat -- almost no noticeable slope) or all the area within 30 m of the AA edge is other wetlands.	0
		2-5%	0
		5-30%	0
		>30%	0
F55	Cliffs or Steep Banks	In the AA or within 100 m, there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1	Do not include upturned trees as potential den sites. [POL, SBM]
F56	New or Expanded Wetland	Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment):	Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens]
		No.	0
		yes, and created or expanded 20 - 100 years ago.	0
		yes, and created or expanded 3-20 years ago.	0
		yes, and created or expanded within last 3 years.	0
		yes, but time of origin or expansion unknown.	0
		unknown if new or expanded within 20 years or not.	1
F57	Burn History	More than 1% of the AA's previously vegetated area:	Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR]
		burned within past 5 years.	0
		burned 6-10 years ago.	0
		burned 11-30 years ago.	0
		burned >30 years ago, or no evidence of a burn and no data.	1
F58	Visibility	The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the AA (select one) is:	[PU, STR, WBFv]
		<25%	1
		25-50%	0
		>50%	0
F59	Non-consumptive Uses - Actual or Potential	Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists:	[PU, STR]
		For an average person, walking is physically possible in (not just near) >5% of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets.	1
		Maintained roads, parking areas, or foot-trails are within 10 m of the AA, or the AA can be accessed part of the year by boats arriving via contiguous waters.	0
		Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours.	0
F60	Unvisited Core Area	The percentage of the AA almost never visited by humans during an average growing season probably comprises: [Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail]	[AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN]
		<5% and no inhabited building is within 100 m of the AA.	0
		<5% and inhabited building is within 100 m of the AA.	0
		5-50% and no inhabited building is within 100 m of the AA.	0
		5-50% and inhabited building is within 100 m of the AA.	0
		50-95%, with or without inhabited building nearby.	0
		>95% of the AA with or without inhabited building nearby.	1
F61	Frequently Visited Area	The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [see note above]	[AM, PH, PU, SBM, STR, WBF, WBN]
		<5%. If F61 was answered ">95%" (mostly never visited), SKIP to F65.	1
		5-50%	0
		50-95%	0
		>95% of the AA.	0
F62	BMP - Soils	Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter "1" if true.	[PH, PU]
F63	BMP - Wildlife Protection	Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the AA at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true.	[AM, PU, WBF, WBN]
F64	Consumptive Uses (Provisioning Services)	Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply.	[FAv, FRv, WBFv]
		low-impact commercial timber harvest (e.g., selective thinning).	0
		commercial or traditional-use harvesting of native plants, their fruits, or mushrooms.	0
		waterfowl hunting.	0
		fishing.	0
		trapping of furbearers.	0
		none of the above.	0
F65	Domestic Wells	The closest wells or water bodies that currently provide drinking water are:	[NRv]
		Within 0-100 m of the AA.	0
		100-500 m away.	0
		>500 m away, or no information.	1
F66	Calcareous Fen	The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying SupplInfo file for list of plant indicators (calciphiles). Enter 1 if more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0, but if not able to identify those and no information, change to blank.	[PH, PR]

BuffAllNat

**Stressor (S) Data Form for Non-Tidal Wetlands. WESP for Atlantic Canada. Version 1.2.1**

<b>S1</b>	<b>Aberrant Timing of Water Inputs</b>	<b>Data</b>
<p><i>In the last column, place a check mark next to any item that is likely to have caused the timing of water inputs (but not necessarily their volume) to shift by hours, days, or weeks, becoming either more muted (smaller or less frequent peaks spread over longer times, more temporal homogeneity of flow or water levels) or more flashy (larger or more frequent spikes but over shorter times). [FA, FR, INV, PH, STR]</i></p>		
stormwater from impervious surfaces that drains directly to the wetland		
water subsidies from wastewater effluent, septic system leakage, snow storage areas, or irrigation		
regular removal of surface or groundwater for irrigation or other consumptive use		
flow regulation in tributaries or water level regulation in adjoining water body, or other control structure at water entry points that regulates inflow to the wetland		
a dam, dike, levee, weir, berm, or fill -- within or downgradient from the wetland -- that interferes with surface or subsurface flow in/out of the AA (e.g., road fill, wellpads, pipelines)		
excavation within the wetland, e.g., dugout, artificial pond, dead-end ditch		
artificial drains or ditches in or near the wetland		
accelerated downcutting or channelization of an adjacent or internal channel (incised below the historical water table level)		
logging within the wetland		
subsidence or compaction of the wetland's substrate as a result of machinery, livestock, fire, drainage, or off road vehicles		
straightening, ditching, dredging, and/or lining of tributary channels		
<p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items had no measurable effect on the timing of water conditions in any part of the AA, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p>		
	Severe (3 points)	Mild (1 point)
Spatial extent of timing shift within the wetland	>95% of wetland	<5% of wetland
When most of the timing shift began	<3 yrs ago	10-100 yrs ago
<p><i>Score the following 2 rows only if the altered inputs began within past 10 years, and only for the part of the wetland that experiences those.</i></p>		
Input timing now vs. previously	shift of weeks	shift of hours or minutes
Flashiness or muting	became very flashy or controlled	became mildly flashy or controlled
	<b>Sum=</b>	<b>0</b>
	<b>Final Score=</b>	<b>0.00</b>

<b>S2</b>	<b>Accelerated Inputs of Contaminants and/or Salts</b>	
<p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of contaminants or salts to the AA. [AM, FA, PH, POL, STR]</i></p>		
stormwater or wastewater effluent (including failing septic systems), landfills, industrial facilities		
metals & chemical wastes from mining, shooting ranges, snow storage areas, oil/ gas extraction, other sources (download many locations from National Pollutant Release Inventory and view KMZ overlay in Google Earth <a href="https://www.ec.gc.ca/nrnp-npri/default.asp?lang=En&amp;n=B85A1846-1">https://www.ec.gc.ca/nrnp-npri/default.asp?lang=En&amp;n=B85A1846-1</a> )		
road salt		
spraying of pesticides, as applied to lawns, croplands, roadsides, or other areas in the CA		
<p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly higher levels of contaminants and/or salts, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p>		
	Severe (3 points)	Mild (1 point)
Usual toxicity of most toxic contaminants	industrial effluent, mining waste, unmanaged landfill	low density residential
Frequency & duration of input	frequent and year-round	infrequent & during high runoff events mainly
AA proximity to main sources (actual or potential)	0 - 15 m	in more distant part of contributing area
	<b>Sum=</b>	<b>0</b>
	<b>Final Score=</b>	<b>0.00</b>

<b>S3</b>	<b>Accelerated Inputs of Nutrients</b>	
<p><i>In the last column, place a check mark next to any item -- occurring in either the wetland or its CA -- that is likely to have accelerated the inputs of nutrients to the wetland. [NRv, PRv, STR]</i></p>		
stormwater or wastewater effluent (including failing septic systems), landfills		
fertilizers applied to lawns, ag lands, or other areas in the CA		
livestock, dogs		
artificial drainage of upslope lands		
<p><i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "0"s for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i></p>		
	Severe (3 points)	Mild (1 point)
Type of loading	high density of unmaintained septic, some types of industrial sources	livestock, pets, low density residential
Frequency & duration of input	frequent and year-round	infrequent & during high runoff events mainly
AA proximity to main sources (actual or potential)	0 - 15 m	in more distant part of contributing area
	<b>Sum=</b>	<b>0</b>
	<b>Final Score=</b>	<b>0.00</b>

S4	<b>Excessive Sediment Loading from Contributing Area</b>				
	<i>In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windborne sediment reaching the wetland from its CA. [FA, FR, INV, PH, SRv, STR]</i>				
	erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires				
	erosion from construction, in-channel machinery in the CA				
	erosion from off-road vehicles in the CA				
	erosion from livestock or foot traffic in the CA				
	stormwater or wastewater effluent				
	sediment from road sanding, gravel mining, other mining, oil/ gas extraction				
	accelerated channel downcutting or headcutting of tributaries due to altered land use				
	other human-related disturbances within the CA				
	<i>If any items were checked above, then for each row of the table below, assign points (3, 2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Erosion in CA	extensive evidence, high intensity*	potentially (based on high-intensity* land use) or scattered evidence	potentially (based on low-intensity* land use) with little or no direct evidence	0
	Recentness of significant soil disturbance in the CA	current & ongoing	1-12 months ago	>1 yr ago	0
Duration of sediment inputs to the wetland	frequent and year-round	frequent but mostly seasonal	infrequent & during high runoff events mainly	0	
AA proximity to actual or potential sources	0 - 15 m	15-100 m	in more distant part of contributing area	0	
* high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment			Sum=	0	
			Final Score=	0.00	
S5	<b>Soil or Sediment Alteration Within the Assessment Area</b>				
	<i>In the last column, place a check mark next to any item present in the wetland that is likely to have compacted, eroded, or otherwise altered the wetland's soil. Consider only items occurring within past 100 years or since wetland was created or restored (whichever is less). [CS, INV, NR, PH, SR, STR]</i>				
	compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods				
	leveling or other grading not to the natural contour				
	tillage, plowing (but excluding disking for enhancement of native plants)				
	fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland				
	excavation				
	ditch cleaning or dredging in or adjacent to the wetland				
	boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments				
	artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments				
	<i>If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure and/or topography, then leave the "0's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present.</i>				
		Severe (3 points)	Medium (2 points)	Mild (1 point)	
	Spatial extent of altered soil	>95% of wetland or >95% of its upland edge (if any)	5-95% of wetland or 5-95% of its upland edge (if any)	<5% of wetland and <5% of its upland edge (if any)	0
	Recentness of significant soil alteration in wetland	current & ongoing	1-12 months ago	>1 yr ago	0
Duration	long-lasting, minimal veg recovery	long-lasting but mostly revegetated	short-term, revegetated, not intense	0	
Timing of soil alteration	frequent and year-round	frequent but mostly seasonal	mainly during one-time or scattered events	0	
			Sum=	0	
			Final Score=	0.00	

Wetland ID:	WL25
Date:	11/28/17
Observer:	Marina Dulmage, Amanda Facey
Latitude & Longitude (decimal degrees):	45.650638 Lat, -62.678142 Long

Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed.

*Results for this Assessment Area (AA):*

Wetland Functions or Other Attributes:	Function Score (Normalised)	Function Rating	Benefits Score (Normalised)	Benefits Rating	Function Score (raw)	Benefits Score (raw)
Water Storage & Delay (WS)	7.67	Higher	0.12	Lower	7.62	0.94
Stream Flow Support (SFS)	0.00	Lower	0.00	Lower	0.00	0.00
Water Cooling (WC)	4.00	Moderate	0.00	Lower	2.67	0.00
Sediment Retention & Stabilisation (SR)	10.00	Higher	0.31	Lower	10.00	0.19
Phosphorus Retention (PR)	10.00	Higher	0.00	Lower	10.00	0.33
Nitrate Removal & Retention (NR)	10.00	Higher	0.00	Lower	10.00	3.33
Carbon Sequestration (CS)	4.15	Moderate			6.26	
Organic Nutrient Export (OE)	0.00	Lower			0.00	
Anadromous Fish Habitat (FA)	0.00	Lower	0.00	Lower	0.00	0.00
Resident Fish Habitat (FR)	0.00	Lower	0.00	Lower	0.00	0.00
Aquatic Invertebrate Habitat (INV)	3.53	Lower	4.12	Moderate	4.66	3.54
Amphibian & Turtle Habitat (AM)	5.25	Moderate	6.27	Higher	6.25	5.57
Waterbird Feeding Habitat (WBF)	5.79	Moderate	5.00	Moderate	4.64	5.00
Waterbird Nesting Habitat (WBN)	3.98	Moderate	5.00	Moderate	3.29	5.00
Songbird, Raptor, & Mammal Habitat (SBM)	8.55	Higher	5.00	Moderate	7.08	5.00
Pollinator Habitat (POL)	9.45	Higher	0.00	Lower	7.82	0.00
Native Plant Habitat (PH)	5.82	Higher	5.73	Moderate	5.86	4.97
Public Use & Recognition (PU)			2.18	Lower		1.88
Wetland Sensitivity (Sens)			9.18	Higher		5.12
Wetland Ecological Condition (EC)			5.40	Moderate		7.22
Wetland Stressors (STR) (higher score means more stress)			2.32	Lower		2.37
<b>Summary Ratings for Grouped Functions:</b>						
HYDROLOGIC Group (WS)	7.67	Higher	0.12	Lower	7.62	0.94
WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS)	10.00	Higher	0.00	Lower	9.53	2.31
AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC)	1.99	Lower	2.55	Lower	3.25	2.36
AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN)	4.44	Moderate	7.07	Higher	4.54	4.34
TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL)	8.90	Higher	4.26	Lower	7.37	4.16
WETLAND CONDITION (EC)			5.40	Moderate		7.22
WETLAND RISK (average of Sensitivity & Stressors)			5.60	Moderate		3.74

NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among the 98 NB calibration wetlands that were assessed previously.

# **Wildlife and Wildlife Habitat Baseline Review (WSP 2018b)**

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GHD LIMITED

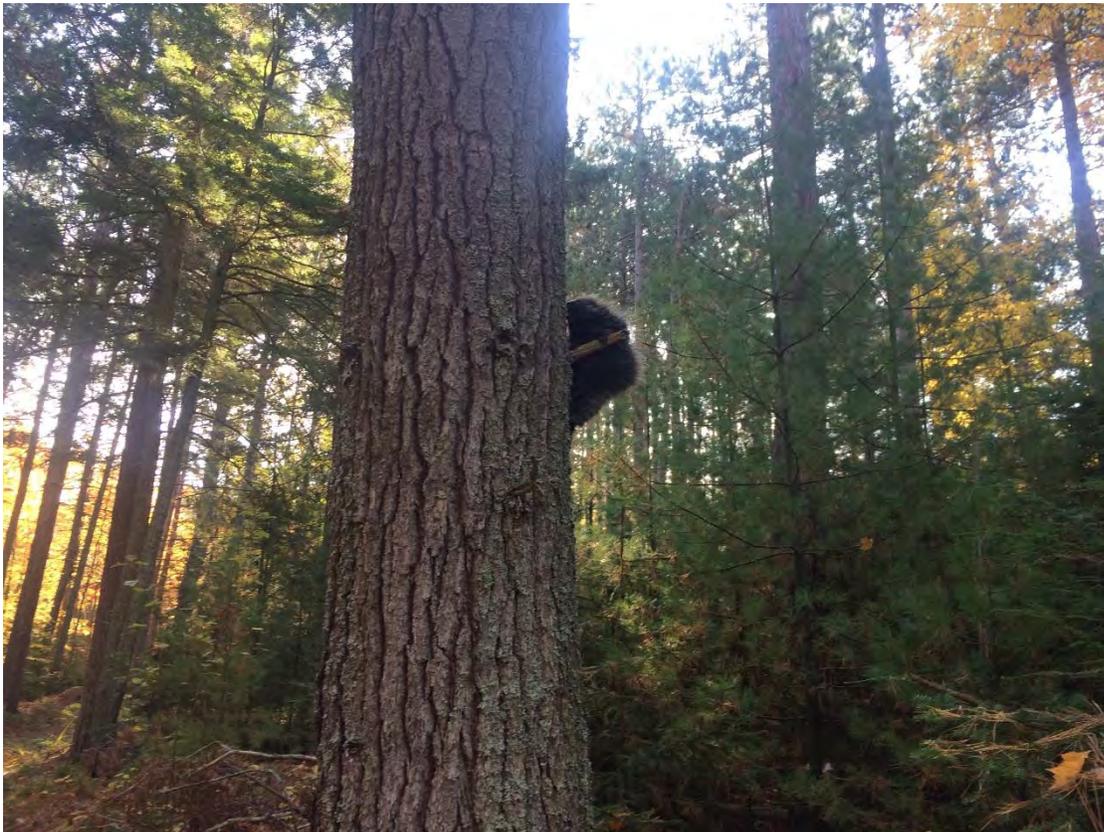
# BOAT HARBOUR REMEDIATION PLANNING AND DESIGN

## WILDLIFE AND WILDLIFE HABITAT BASELINE REVIEW

PICTOU, NS

SEPTEMBER 14, 2018

CONFIDENTIAL





# BOAT HARBOUR REMEDICATION PLANNING AND DESIGN

## WILDLIFE AND WILDLIFE HABITAT BASELINE REVIEW

GHD LIMITED

FINAL  
CONFIDENTIAL

WSP PROJECT NO.: 171-10478  
DATE: SEPTEMBER 14, 2018

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September 14, 2018

CONFIDENTIAL

GHD LIMITED  
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Dear Sir:

**Subject: Boat Harbour Remediation Planning and Design – Wildlife and Wildlife Habitat Baseline Review**

WSP Canada Inc. was retained to complete baseline wildlife and wildlife habitat assessments for the Remediation Project Site located in Pictou County, Nova Scotia, to gain an understanding of the current conditions at Boat Harbour. It is understood that GHD Limited (GHD) on behalf of Nova Scotia Lands inc. is planning remedial action for Boat Harbour Effluent Treatment Facility (BHETF) and requires a baseline conditions report.

This report summarizes the findings of the wildlife and wildlife habitat assessments of the site.

Yours sincerely,

---

Brady Leights, B.Et., Dip.R.M., E.Pt.  
Environmental Technician

---

Christina LaFlamme, M.Sc., EP  
Senior Biologist

cc: Sean Cassidy  
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# SIGNATURES

PREPARED BY



September 11, 2018

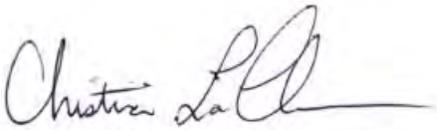
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Brady Leights, B.Et., Dip.R.M., E.Pt.  
Environmental Technician

---

Date

APPROVED BY



September 14, 2018

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Christina LaFlamme, M.Sc., EP  
Senior Biologist

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Date

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# 1 INTRODUCTION

---

## 1.1 INTRODUCTION

This report summarizes the methods and results used to evaluate the terrestrial habitat, wildlife as well as flora and fauna (excluding bird and fish species, as they are covered in a separate report) species at risk (SAR) and species of conservation concern (SOCC), within the Remediation Project Site, by WSP biologists. Areas of significant habitat potential were identified and evaluated for the presence of SAR/SOCC, wildlife species, or their potential for SAR/SOCC and wildlife species.

---

## 1.2 PRIORITY SPECIES LIST METHODOLOGY AND DESKTOP EVALUATION

Several studies (Envirosphere 1992; Dillon 2003; JWEL 2001, 2003, 2004a, 2004b; AMEC 2006; Stantec 2014, 2015) have taken place previously at the BHETF located in Pictou Landing, Nova Scotia. Upon review of these studies, data gaps regarding the state of habitat and presence of SAR/SOCC was apparent. Reports reviewed by WSP commented only briefly on terrestrial habitat makeup and presence of SAR/SOCC. The goal of WSP's assessment was to identify the terrestrial habitat, significant habitat areas and the presence of SAR/SOCC inside the study area. SAR and SOCC are collectively referred to as priority species.

A detailed desktop evaluation to determine the potential for the presence of priority species within the Project area and its immediate surroundings was completed. This desktop evaluation was completed prior to the development of field programs with the purpose of advising survey requirements and their associated methodologies.

Priority species, as defined by the *Guide to Addressing Wildlife Species and Habitat in and EA Registration Document* (Nova Scotia Environment and Labour, 2009), include:

- A SAR is any species which is listed as Endangered, Threatened or of Special Concern under the federal Species at Risk Act (SARA) (Government of Canada, 2002) and any species listed as Endangered, Threatened or Vulnerable under the provincial Nova Scotia Endangered Species Act (NS ESA) (Endangered Species Act, 1998, amended 2010, c. 2, s. 99).
- A SOCC are species listed as S1-S3S4 (provincial rarity rankings) by the Atlantic Canada Conservation Data Centre (ACDC) (see Table 1.1). Using the ACCDC provincial rarity rankings rather than the general status ranks was recommended by Mark Elderkin (Mark Elderkin, Pers. comm., 2018).

TABLE 1.1: ACCDC S-RANK DEFINITIONS

S-RANK	DEFINITION
SX	<b>Presumed Extirpated</b> - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
S1	<b>Critically Imperiled</b> - Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2	<b>Imperiled</b> - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S-RANK	DEFINITION
S3	<b>Vulnerable</b> - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	<b>Apparently Secure</b> - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	<b>Secure</b> - Common, widespread, and abundant in the province.
SNR	<b>Unranked</b> - Nation or state/province conservation status not yet assessed.
SU	<b>Unrankable</b> - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA	<b>Not Applicable</b> - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#	<b>Range Rank</b> - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
SH	<b>Possibly Extirpated (Historical)</b> - Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
Not Provided	Species is not known to occur in the province.

Source: ACCDC (Atlantic Canada Conservation Data Centre, 2018)

This priority list of species was then narrowed by broad geographic area along with input from Nova Scotia Department of Natural Resources (NSDNR) (M. Elderkin, pers. Comm., July 25, 2017). Based on a review of the geographic area and discussions with NSDNR, it was determined that targeted field assessments for mainland moose (*Alces alces americana*), Canada lynx (*Lynx canadensis*) and SARA listed bat species were not required.

Table 1.2 provides the final list of priority species for the Project.

TABLE 1.2: PRIORITY SPECIES

COMMON NAME	SCIENTIFIC NAME	COSEWIC	SARA	NSESA	S-RANK	GS-RANK	POTENTIAL PRESENCE
Blanding's Turtle	<i>Emydoidea blandingii</i>	Endangered	Endangered	Endangered	S1	1 At Risk	Low
Wood Turtle	<i>Glyptemys insculpta</i>	Threatened	Threatened	Threatened	S2	3 Sensitive	Low
Snapping Turtle	<i>Chelydra serpentina</i>	Special Concern	Vulnerable	Vulnerable	S3	3 Sensitive	Low
Eastern Ribbonsnake	<i>Thamnophis sauritus pop. 3</i>	Threatened	Threatened	Threatened	S2S3	1 At Risk	Low
Black Ash	<i>Fraxinus nigra</i>	-	-	Threatened	S1S2	1 At Risk	High
Hop Flatsedge	<i>Cyperus lupulinus ssp. macilentus</i>	-	-	-	S1	2 May Be At Risk	Possible
Red Pigweed	<i>Chenopodium rubrum</i>	-	-	-	S2	2 May Be At Risk	Possible

COMMON NAME	SCIENTIFIC NAME	COSEWIC	SARA	NSESA	S-RANK	GS-RANK	POTENTIAL PRESENCE
Canada Lily	<i>Lilium canadense</i>	-	-	-	S2	2 May Be At Risk	Possible
Purple-veined Willowherb	<i>Epilobium coloratum</i>	-	-	-	S2	3 Sensitive	Possible
Canada Germander	<i>Teucrium canadense</i>	-	-	-	S3	3 Sensitive	Possible
Buttonbush Dodder	<i>Cuscuta cephalanthi</i>	-	-	-	S2	5 Undetermined	Possible

The compilation of the priority species list and the review of all other available desktop resources for priority species observations is done primarily to advise field methodology, and inform field staff to the species they are likely to encounter during field surveys. The desktop review for priority species provided the Project Team with information that directly guided the methods and the timing of all field programs. All field staff reviewed the desktop evaluation for priority species prior to commencing field work. This allowed field staff to review field identification guides and ensured that they were familiar with priority species identification and their status ranks.

# 2 TERRESTRIAL FLORA

---

## 2.1 DESKTOP REVIEW

Several studies have taken place previously at the BHETF located in Pictou Landing, Nova Scotia. Upon review of previous studies, data gaps regarding the state of terrestrial habitat was apparent. While some reports comment briefly on terrestrial habitat makeup, there is no detailed description of the forest stands present. The goal of WSP's assessments was to identify the terrestrial habitat inside the study area as well as any flora SAR/SOCC.

Prior to conducting the habitat survey, NSDNR forest and non-forest data, NSDNR's significant species and habitat database, and previous reports (Envirosphere 1992; Dillon 2003; JWEL 2001, 2003, 2004a, 2004b; AMEC 2006; Stantec 2014, 2015) were reviewed to better understand the habitat types and significant habitats that may be present within the BHETF.

Figure 1 in Appendix A shows NSDNR's forest and non-forest layers recorded at the BHETF. NSDNR's land classification has the site separated into fifteen categories: Natural Stand (Forested), Plantation, Brush, Alders (79% Greater), Clear Cut, Wetlands (General), Open Bog, Lake Wetland, Cliffs/Dunes/Rocks, Agriculture, Urban, Beach, Gravel Pit, Powerline Corridor, and Misc (any non-forest not designated by other categories).

As can be seen on Figure 1 (Appendix A), Natural Stand (Forested) are the dominant category followed by Wetland. Mixedwoods are the dominant forest stands covering approximately 38.9% of the study area. This is closely followed by hardwood stands covering approximately 38.6% of the study area, and softwood stands accounting for the remaining 22.5%.

Figure 2 in Appendix A shows NSDNR's significant species and habitat recorded at the BHETF. A significant Migratory Bird area is located along the marine portion of the pipeline corridor across the East River (580 metres southwest of the PA). In addition, found near the Project area is a Species at Risk area at lighthouse beach (780 metres north of the PA), another Migratory Bird area (1.52 kilometres northwest of the PA), and an "Other Habitat area", (700 metres south of the PA), which is considered to be significant due to the presence of Bald Eagles (*Haliaeetus leucocephalus*) (F. McKinnon, NSDNR, pers.comm. September 14, 2018).

---

## 2.2 BASELINE PROGRAM METHODOLOGY

### 2.2.1 HABITAT SURVEY

Using available forestry and wetland databases, habitat survey routes were created with the goal of assessing all the major habitat types and landscape features.

The habitat survey methods and results are presented with the acknowledgment of three biases built into the survey methods.

- Focus on upland habitat. This bias was purposefully built into the survey methods with the understanding that all wetlands within the study area will be delineated and described in detail and their function as habitats within the landscape of the study area would be captured in the wetland program.
- Focus on forested landscape versus non-forested landscapes. In this context, clear cut lands, or those which have experienced timber harvesting of any sort, are still considered forested because the removal of timber is only a temporary disturbance. Non-forested portions of the landscape, such as roads or mowed lawn areas, were not assessed during the habitat survey simply because they lack forest cover to be described and their capability for supporting forest cover in the foreseeable future is low based on the level of disturbance.
- Habitat surveys completed at discrete points. These habitat survey points describe the habitat in 'snapshots' of specific locations.

The results of the habitat survey are meant to describe the diversity of habitat types present throughout the study area and the relative abundance thereof, rather than an absolute percent cover of each habitat type throughout the study area.

The habitat field assessments were completed between August 2017, and July 2018 within the Project site by WSP biologists. Habitat survey points (HP's) were established along the survey route based on anticipated and observed habitat types. The distance between habitat survey points was dependent upon the complexity of major habitat types across the landscape.

The Forest Ecosystem Classification (FEC) for Nova Scotia guide book was used to describe habitat characteristics within the habitat survey points. The following information was collected at each habitat survey point:

- Vegetation type was determined using Part 1 of the FEC guide (Neily et al., 2011). Each stand was classified by overall forest group code and vegetation type using the keys provided in the guide book. Forest groups are general groupings of vegetation types. Within each forest group (open woodland or tolerant hardwood, for example), there are several specific vegetation types. Vegetation types are recurring and identifiable plant communities which reflect differences in site conditions, natural disturbance regimes, and successional stage. For example, TH4 is a tolerant hardwood forest group dominated by sugar maple (*Acer saccharium*) and white ash (*Fraxinus Americana*) vegetation type, while TH6 is a tolerant hardwood forest group dominated by red oak (*Quercus rubra*) and yellow birch (*Betula alleghaniensis*) vegetation type.
- Ecosite was determined using Part 3 of the FEC guide (Keys et al., 2011). This guide provides keys to identify ecosites using an edatopic grid, which is a two-dimensional diagram used to plot ecosystems and ecosites based on their relative moisture and nutrient regimes. Ecosites are units which represent ecosystems that have developed under a particular nutrient and moisture regime. A finite range of vegetation types will naturally grow in any given ecosite.
- An approximation of forest stand age was determined using broad classifications for stand age (regenerating, pole, mature, overmature). This approximation is based on a combination of factors relative to trees such as total basal area, level of canopy coverage, senescence of older trees and presence of cavity trees, and species composition of the canopy, shrub and understory vegetation.
- Natural or anthropogenic disturbance is recorded in each site. The level and type of disturbance is identified and the timing of the disturbance is noted as well if it is apparent. Examples of natural disturbances include timber harvesting or road development. Natural disturbance regimes include fire, pests, wind throw, and natural senescence.
- Representative photos were taken of each site.

## **2.2.2 VASCULAR PLANT SURVEY**

As described in the *Guide to Addressing Wildlife Species and Habitat in an EA Registration Document* (Nova Scotia Environment and Labour, 2009), a complete vascular plant inventory is not typically required for an environmental assessment. The vascular plant survey focused on the identification of vegetative communities, with particular attention to identifying priority species.

During the habitat surveys, wetland surveys, watercourse surveys, wildlife surveys and spring ephemeral surveys, various portions of the study area were surveyed for SAR and SOCC. This was accomplished by meandering through each habitat type. Surveys were completed between August 2017, and July 2018. The spring ephemeral survey was completed June 4<sup>th</sup> to June 6<sup>th</sup>, 2018.

## **2.2.3 LICHEN SURVEY**

Surveys for lichen priority species as well as indicator species were carried out whenever suitable habitat was encountered during the habitat and wetland surveys. The term "habitat" for lichens includes suitable host tree species, which may be scattered among less or not suitable host trees. Rare lichen species encompass ground-dwelling (terricolous), rock-dwelling (saxicolous) and tree-dwelling (arboreal) lichens, with one species occurring submerged in freshwater.

All suitable substrates (trees, rocks, ground, water courses) were surveyed. Based on previous experience and professional knowledge, the distribution of rare arboreal lichen species is generally correlated with the presence of larger/ older trees. Therefore, certain forest polygons, wetlands and streams were targeted for surveys, as well as any larger trees found among younger trees or shrubs. Particular attention was paid to any older trees of tree species which are known to be preferred substrate for rare lichens, independent of the surrounding habitat.

A lichen survey was carried out in November 2017 targeting all priority species lichen in their potential habitats.

---

## 2.3 BASELINE CONDITIONS

### 2.3.1 HABITAT ASSESSMENT

The BHETF is found near Pictou Landing, Nova Scotia. It is located within the Northumberland Bras d'Or Lowlands Ecoregion of the Atlantic Maritime Ecozone. Ecoregions are subdivisions of the larger ecozones and express macroclimate as a distinctive ecological response to climate through soils and vegetation (Neily et al., 2005).

Ecoregions are further subdivided into ecodistricts, which reflect macroelements of the physical and biological attributes of ecosystems which will ultimately influence biodiversity. The Project is situated in the Northumberland Lowlands Ecodistrict. This low-lying area extends from the Pictou area into New Brunswick, where the ecodistrict is called the *Northumberland Coastal*. In this area, elevation rarely rises above 50 metres above sea level (masl), but is surrounded by mountainous ecodistricts on all sides. Only one area is known to exceed 100 metres (m) of elevation, this area is known as "Streets Ridge". The growing climate of this ecodistrict is considered one of the best in the province, and receives the lowest amount of annual mean precipitation in the province, at 1128 millimetres (mm). This area is dominated by coniferous forest, with black spruce (*Picea mariana*) and red spruce (*Picea rubens*) the dominant species. Early succession species such as balsam fir (*Abies balsamea*), red maple (*Acer rubrum*), white birch (*Betula papyrifera*), and trembling aspen (*Populus tremuloides*), as well as large-toothed aspen (*Populus grandidentata*) are also apparent in most stands (Neiley et. al., 2005). Jack pine (*Pinus banksiana*), and black spruce (*Picea mariana*) can be found in relative abundance in the northern section of the Ecodistrict, in the Cobequid area. As soils are imperfectly drained in much of the Ecodistrict, areas of eastern larch (*Larix laricina*) are apparent, and may also appear in abandoned fields, where white spruce is usually common in other ecodistricts. Species such as yellow birch, eastern hemlock (*Tsuga canadensis*), grey birch (*Betula populifolia*), American beech (*Fagus grandifolia*), white ash, and white spruce (*Picea glauca*) are also apparent throughout the district (Neily et. al., 2005).

Ecosites are units which represent ecosystems that have developed under a variety of conditions and influences, but which have similar moisture and nutrient regimes. An ecosite is associated with a finite range of soil and site conditions and a finite range of vegetation types that grow naturally under those conditions. Ecosites represent general productivity units and provide an ecological setting through which vegetation and soil types can be grouped and compared. In this application, the value in ecosite classification lies in wildlife habitat analysis and biodiversity considerations. For example, ecosite classification can be used to help determine the likelihood of finding particular rare plants that prefer specific moisture or nutrient regimes.

Ecosites identified at the BHETF include AC10, AC6, AC2, and AC13. A description for each of these ecosites as described by the Department of Natural Resources in "Forest Ecosystem Classification for Nova Scotia Part 3: Ecosites 2010" (Keys et al., 2011) is found below.

#### AC10: FRESH – MEDIUM / RED SPRUCE – HEMLOCK

Occurring mainly on well drained slopes with medium textured glacial till deposits, this ecosite has fresh, nutrient medium soils which generally support late successional forests dominated by red spruce, eastern hemlock, and yellow birch. Early succession forests contain balsam fir, white birch, red maple, and trembling aspen. The shrub layer is usually dominated by regenerating softwoods, and typical softwood forest plants are found in the herb layer, such a wild lily of the valley (*Maianthemum canadense*), starflower (*Trientalis borealis*), blue-bead lily (*Clintonia borealis*), partridge berry (*Vaccinium vitis-idaea*), and wood fern (*Dryopteris spp.*). Moss species found in this

ecosite type are usually Schreber’s moss (*Pleurozium schreberi*), along with stair-step moss and bazzania to a lesser extent (Keys et al., 2011).

**AC6: FRESH – POOR / BLACK SPRUCE – WHITE PINE**

Occurring mainly on well drained slopes with coarse textured glacial till deposits, this ecosite has fresh, nutrient poor soils which generally support closed canopy stands of white pine (*Pinus strobus*) and black spruce. When balsam fir is present, it is generally intermediate in the canopy and of low vigour. Early successional stands are dominated by large-tooth aspen, red oak and red maple. On slightly richer sites, red spruce and/or hybrid spruce are possible. Ericaceous species dominate the shrub layer (mainly lambkill-*Kalmia angustifolia* and blueberry-*Vaccinium angustifolium*), with wild raisin (*Viburnum nudum*), witch-hazel (*Hamamelis virginiana*) and huckleberry (*Gaylussacia baccata*) also common. Herb coverage and diversity are low and favour species which tolerate acid soils such as bracken (*Pteridium aquilinum*), teaberry (*Gaultheria procumbens*), mayflower (*Epigaea repens*) and bunchberry (*Cornus canadensis*). The forest floor is dominated by Schreber’s moss (Keys et al., 2011).

**AC2: FRESH – VERY POOR / BLACK SPRUCE – PINE**

Occurring mainly on gentle slopes or well drained level areas with coarse textured glacial till or glaciofluvial deposits, this ecosite has fresh, nutrient very poor soils which generally support poorly stocked forests of black spruce, red pine (*Pinus resinosa*), jack pine and white pine. Ericaceous species dominate the shrub layer (mainly lambkill, rhodora and blueberry) often with significant black spruce regeneration. Bracken cover can be extensive in the herb layer with teaberry and bunchberry also common. The forest floor is dominated by Schreber’s moss (Keys et al., 2011).

**AC13: FRESH – RICH / SUGAR MAPLE – BEECH**

Occurring mainly on well drained slopes with medium textured glacial till deposits, this ecosite has fresh, nutrient rich soils which generally support late successional forests dominated by sugar maple and beech along with yellow birch, red maple, white ash, and occasionally ironwood (*Ostrya virginiana*). Earlier successional forests contain aspen, white birch and red maple. Old field forests of white spruce and white pine are also common where upland hardwood forests were cleared for agriculture and later abandoned. Typical hardwood forest plants dominate all layers in this ecosite. The shrub layer usually includes regenerating trees along with beaked hazelnut (*Corylus cornuta*), striped maple (*Acer pensylvanicum*), fly-honeysuckle (*Lonicera canadensis*) and hobblebush (*Viburnum lantanoides*). Ferns are extensive in the herb layer and include hay-scented fern (*Dennstaedtia punctilobula*), New York fern (*Thelypteris noveboracensis*) and wood fern species. Except for old field sites, bryophytes are typically absent from the forest floor, but can be found on stumps, downed wood and live tree boles (Keys et al., 2011).

A total of 69 habitat points was surveyed. Figure 3 in Appendix A illustrates the locations of these points. Of the 69 stand types assessed on site, ecosite AC10 was the most abundant, making up 60% of the stands, followed by AC13, which consisted of 22% stands, followed by AC6, and AC2, at 9% each. Details of each habitat survey point are outlined in Table 2.1.

**TABLE 2.1: HABITAT SURVEY RESULTS WITHIN THE STUDY AREA**

HABITAT SURVEY POINT	ECOSITE	VT*	STAND AGE	LEVEL AND TYPE OF DISTURBANCE	COMMENTS
HP001	AC6	IH2	Pole	High, Constructed Berm at Edge	Berm- Hardwood Forest Birch dominant
HP002	AC6	IH2	Pole	Low	Mixed Forest Oak/ Pine dominant
HP003	AC6	IH2	Pole	Low	Mixed Forest Oak/ Pine dominant
HP004	AC10	SH4	Pole	Low	Softwood Forest Pine dominant

HABITAT SURVEY POINT	ECOSITE	VT*	STAND AGE	LEVEL AND TYPE OF DISTURBANCE	COMMENTS
HP005	AC10	SH2	Pole	Low	Softwood Forest Pine dominant
HP006	AC10	SH2	Pole	Low	Mixed Woods Hemlock/Pine/Maple dominant
HP007	AC10	SH5	Pole	Low, ATV Trail	Softwood Forest Spruce dominant
HP008	AC10	IH6	Pole	Low	Mixed Forest Fir/Maple dominant
HP009	AC10	IH6	Regenerating	Moderate, Adjacent to Landfill Site	Mixed Forest Fir/Birch dominant
HP010	AC10	SH3	Mature	Low	Mixed Forest Hemlock/Maple
HP011	AC10	SH6	Regenerating	Low, Blowdown	Softwood Forest Fir dominant
HP012	AC10	SH6	Pole	Low	Softwood Forest Spruce dominant
HP013	AC2	SP2	Mature	Low, Plantation	Softwood Forest Red Pine dominant
HP014	AC10	IH6	Pole	Low	Mixed Forest Spruce/Maple dominant
HP015	AC10	IH6	Regenerating	High, Harvested	Mixed Forest Birch/Spruce dominant
HP016	AC10	SH2	Mature	Low	Mixed Forest Hemlock/Aspen dominant
HP017	AC10	SH4	Regenerating	High, Harvested	Softwood Forest Birch/Spruce dominant
HP018	AC10	IH6	Pole	Low	Mixed Forest Hemlock/Maple dominant
HP019	AC10	SH2	Mature	Low	Softwood Forest Hemlock dominant
HP020	AC10	IH6	Pole	Low	Hardwood Forested Wetland, Red Maple dominant
HP021	AC10	MW5	Mature	Low	Mixed Forest Spruce/Birch dominant
HP022	AC10	MW5	Mature	Low	Mixed Forest Spruce/Birch dominant
HP023	AC10	SH5	Pole	Low, Blowdown	Softwood Forest Red Spruce dominant
HP024	AC10	SH2	Pole	Low, Blowdown	Softwood Forest Red Spruce dominant

HABITAT SURVEY POINT	ECOSITE	VT*	STAND AGE	LEVEL AND TYPE OF DISTURBANCE	COMMENTS
HP025	AC13	IH5	Pole	Low, Blowdown	Mixed Forest Spruce/Birch dominant
HP026	AC13	IH5	Pole	Low	Mixed Forest Spruce/Ash dominant
HP027	AC13	IH5	Regenerating	Moderate, Harvested	Hardwood Forest Aspen/Birch dominant
HP028	AC10	SH3	Mature	Low	Softwood Forest Hemlock/Spruce dominant
HP029	N/A	Anthropogenic	N/A	High, Mowed Lawn	Landscaped Area
HP030	N/A	Anthropogenic	N/A	High, Mowed Lawn	Wet Area in Landscaped Habitat
HP031	AC10	SH3	Pole	Low, ATV Trail	Softwood Forest Hemlock dominant
HP032	AC10	IH6	Pole	Low, ATV Trail	Hardwood Forest Birch/Aspen dominant
HP033	AC10	SH3	Pole	Low, Blowdown	Coniferous Forest Spruce/Hemlock dominant
HP034	AC10	SH3	Mature	Low, ATV Trail	Coniferous Forest Hemlock dominant
HP035	AC10	MW3	Pole	Low, ATV Trail	Hardwood Forest Aspen dominant
HP036	AC10	SH3	Pole	Low, ATV Trail	Mixed Forest Hemlock/Spruce/Aspen dominant
HP037	AC10	OF5	Mature	Low, ATV Trail	Hardwood Forest Aspen dominant
HP038	AC13	TH5	Mature	Moderate, ATV Trail and BHSL adjacent	Hardwood Forest Aspen dominant
HP039	AC6	IH1	Pole	Moderate, ATV Trail and BHSL adjacent	Hardwood Forest Aspen dominant
HP040	AC13	TH5	Mature	Low	Hardwood Forest Aspen/Beech dominant
HP041	AC13	IH3	Pole	Low	Hardwood Forest Aspen dominant
HP042	AC6	IH1	Pole	Moderate, ATV Trail and BHSL adjacent	Hardwood Forest Aspen/Birch dominant
HP043	AC10	MW2	Pole	Low	Mixed Forest Birch/Spruce dominant
HP044	AC13	TH5	Pole	Moderate, Beech back disease	Hardwood Forest Beech dominant

HABITAT SURVEY POINT	ECOSITE	VT*	STAND AGE	LEVEL AND TYPE OF DISTURBANCE	COMMENTS
HP045	AC2	SP2	Pole	Low, Plantation	Softwood Forest Red Pine dominant
HP046	AC13	TH5	Pole	Low	Hardwood Forest Birch/Beech dominant
HP047	AC10	MW3	Pole	Low	Mixed Forest Hemlock/Yellow Birch dominant
HP048	AC10	MW5	Mature	Low	Hardwood Forest Aspen dominant
HP049	AC13	TH5	Pole	Low	Hardwood Forest Birch/Beech dominant
HP050	AC10	MW3	Pole	Low	Mixed Forest Hemlock / Yellow Birch dominant
HP051	AC10	MW2	Pole	Low	Mixed Forest Pine/Maple dominant
HP052	AC13	TH5	Pole	Moderate, Beech back disease	Hardwood Forest Beech/Birch dominant
HP053	AC13	TH5	Pole	Moderate, Beech back disease	Hardwood Forest Beech/Birch dominant
HP054	AC13	IH3	Pole	Low	Hardwood Forest Aspen/Birch dominant
HP055	AC10	IH6	Pole	Low	Hardwood Forest Maple/Birch dominant
HP056	AC13	IH4	Regenerating	Low	Hardwood Forest Aspen/Birch dominant
HP057	AC6	IH1	Pole	Low	Hardwood Forest Aspen dominant
HP058	AC13	TH5	Pole	Moderate, Beech back disease	Hardwood Forest Beech/Birch dominant
HP059	AC13	IH6	Pole	Low	Hardwood Forest Maple/Birch dominant
HP060	AC10	IH6a West Side/ SP3a East Side	Pole	Moderate, Trail and Dam	Mixed Forest/ Hardwood Forest
HP061	AC2	SP2	Pole	Low, Plantation	Softwood Forest Red Pine dominant
HP062	AC2	SP2	Pole	Low, Plantation	Softwood Forest Red Pine dominant
HP063	AC2	SP2	Pole	Low, Plantation	Softwood Forest Red Pine dominant
HP064	AC10	MW4	Pole	Low, ATV Trail	Mixed Forest Fir/Maple dominant
HP065	AC2	SP3a	Pole	Low, Monitoring wells	Coniferous Forest Pine dominant

HABITAT SURVEY POINT	ECOSITE	VT*	STAND AGE	LEVEL AND TYPE OF DISTURBANCE	COMMENTS
HP066	AC10	MW5	Pole	Low	Mixed Forest Birch/Fir dominant
HP067	AC10	SH8	Pole	Low	Coniferous Forest Fir dominant
HP068	AC10	IH6	Pole	Low	Hardwood Forest Birch/Maple dominant
HP069	AC10	MW2	Pole	Low	Mixed Forest Spruce/Maple dominant

\*VT: *Vegetation Type*

The abundance of hillslope at the BHETF is consistent with the ecosites identified at site. Conifer-dominant stands were much more common than stands consisting mainly of deciduous species, with the exception of wetland areas, where deciduous shrub species were widespread. Monocultures were considered rare at the BHETF, with scattered stands of eastern hemlock, red spruce, red pine, and an area of American beech. Most stands consisted of three or more tree species, usually a mix of longer lived softwood species with shade-tolerant hardwoods such as red maple, yellow birch, and American beech.

Eastern hemlock, and red spruce were considered the most dominant softwood species at the BHETF, with each of these species found in most areas of the site. Red maple and trembling aspen were the dominant hardwood species. Shrub species such as wild raisin, speckled alder (*Alnus incana*), Canada holly (*Ilex verticillata*), and beaked hazelnut were common throughout the site, and herbaceous vegetation such as starflower, wild lily of the valley, sarsaparilla (*Aralia nudicaulis*), blue-bead lily, twinflower (*Linnaea borealis*), painted trillium (*Trillium undulatum*), and ferns such as bracken, cinnamon fern (*Osmundastrum cinnamomeum*), and Christmas fern (*Polystichum acrostichoides*) were widespread as well.

In regenerating stands, tree species such as balsam fir, grey birch, and trembling aspen were considered the most common.

While several stands are considered the same type, this does not necessarily mean that each of those stands offer the same type or spatial extent of habitat, as not every stand was in the same stage of succession.

One remark on the vegetation inventory at the BHETF is the lack of eastern larch on site. Research shows that this species is not tolerant of sulfur dioxide, and will not become established in areas where this chemical is apparent (University of New Hampshire, 1980). Sulfur dioxide is a chemical commonly associated with the production of kraft paper products (Pinkerlon, 1993), and effluent at the Remediation Project Site likely contains this substance. Eastern larch habitat was apparent and even abundant in some areas on site, so encountering very few individuals of this species on site was considered abnormal.

### 2.3.2 VASCULAR PLANT ASSESSMENT

A total of 222 species of vascular plants were identified during field surveys conducted between August 2017 and July 2018. The diversity of species is moderate, especially considering the impacted surface water and soils found within the Project area. The vegetation species observed are largely native species, with exotic species confined mainly in the disturbed areas of the site. The species and communities of vascular plants encountered were typical given the eco-regional context, nutrient regimes, moisture regimes, and disturbance regimes.

Habitat types ranged from landscaped areas to well-drained drumlin hills comprised mostly of upland species such as eastern hemlock and large-toothed aspen. Seven main types of forest stands are found within the project area and include: Softwood, Eastern Hemlock, Red Pine, Tolerant Hardwood, Intolerant Hardwood, Mixed, and Regenerating.

- Softwood dominant stands- These are dominated by coniferous species such as balsam fir, white and red spruce, eastern hemlock, as well as white and red pines.
- Eastern Hemlock dominant stands- These stands are comprised mostly of eastern hemlock, often with little understory. These stands often host small populations of shade-tolerant hardwood species such as yellow birch, and striped maple as well.
- Red Pine dominant stands- These areas appeared to have had forestry operations carried out in years past. These stands were mostly uniform age, and additional species were nearly absent in these areas evidence of woods roads used for harvesting was apparent.
- Tolerant Hardwood dominant stands- These stands are comprised mostly of hardwood species such as American beech, white ash, sugar maple, striped maple and yellow birch.
- Intolerant Hardwood dominant stands- These stands are comprised mostly of hardwood species such as large-toothed aspen, trembling aspen, red maple, white birch, and grey birch.
- Mixed forest stands- These stands are comprised of a mixture of coniferous and deciduous species. Red maple, white birch, trembling aspen, balsam fir, as well as white ash, yellow birch, Eastern hemlock, and red spruce were common in mixed forest locations.
- Regeneration forest stands- These areas have had vegetation removed previously through either natural or unnatural processes leaving these areas mostly bare of significant canopy cover. Stands are commonly comprised of species including red maple, balsam fir, grey birch, speckled alder, white pine, and red oak (in areas previously burned).

The majority of the site is dominated by Mixed forest stands, with Tolerant Hardwood stands most notably located along the steep slopes of the Northern boundary and Eastern Hemlock stands dominating the western and eastern portions of the site. Regenerating forest stands are more apparent in the southern sections of the project area with patches of Red Pine found in various locations throughout the site. Ages of the stands varied from overmature to early successional. Overmature stands were noted mainly in the northern portions of the project area.

Other terrestrial habitat types observed within the project area included Fallow Pasture Lands, Open Fields and Landscaped Areas.

- Fallow Pasture Lands- These areas are often uniformly aged, comprising of tree species such as red spruce, yellow birch, apple trees, hawthorn, trembling and large tooth aspen, as well as fruiting shrub species with an herbaceous layer composed of various graminoid species, aster species, goldenrods, and raspberry.
- Open field - These areas are comprised mostly of herbaceous species such of aster, goldenrods, raspberry, rose, and various graminoid species.
- Landscaped Areas- These areas are typically mowed fields with planted white spruce trees scattered throughout the managed area.

Fallow Pasture Lands were located in areas where previous homestead foundations are located which are found scattered throughout the project area. The open field and landscaped areas are located mostly in the southern portion of project area in and around existing infrastructure such as the pipeline corridor, buildings and sludge basin.

Of the 222 species identified, only one species is classified as a SAR and another as a SOCC. Black ash (*Fraxinus nigra*) was the only SAR species with regulatory protection found at the BHETF. The black ash was found in localized areas, and is believed to have been planted and not naturally occurring. Discussions with the Pictou Landing First Nation indicated that black ash (known as Wisqoq in Mi'kmaw) was planted in the area a few years ago. Heart-leaved foam flower (*Tiarella cordifolia*) was identified on June 6<sup>th</sup>, 2018 in the northern section of WL-10/WC-5. This species is S2 and considered to be Sensitive. Only one individual was noted by biologists. Figure 4 in Appendix A shows the locations of where black ash and heart-leaved foam flower were found.

A complete plant list of vascular plants identified within the BHETF is available in Appendix B.

### **2.3.3 LICHEN ASSESSMENT**

The BHETF was surveyed for lichens between November 15<sup>th</sup> and November 16<sup>th</sup>, 2017. During these surveys, areas with potential for lichen species classified as SAR were targeted. Cataloguing each individual lichen was

deemed unfeasible, however areas with a high likelihood of lichen inhabitation were favoured for in-depth surveys. Various stand types were encountered by surveyors, and species associated with each stand type were considered when targeting in-depth survey areas. Figure 5 in Appendix A shows the areas where targeted lichen surveys were conducted.

A comprehensive list of lichen species was not completed, as the primary focus was in identifying rare or at-risk lichen species. However, common lichen species observed opportunistically during rare lichen surveys were recorded and are presented in the table below. Twenty species were recorded within the lichen study area. Of these species only one SOCC species, *Leptogium subtile* (S3) was observed in limited quantities just outside the eastern boundary of the Project area. Table 2.2 below provides a list of species observed within the study area.

**TABLE 2.2: LICHEN SPECIES OBSERVED WITHIN THE LICHEN STUDY AREAS**

COMMON NAME	SCIENTIFIC NAME	COSEWIC	SARA	NSESA	S-RANK
Eastern Ragged-rim Lichen	<i>Loxospora ochrophaea</i>	-	-	-	S5
Common Script Lichen	<i>Graphis scripta</i>	-	-	-	S5
Barnacle Lichen	<i>Thelotrema lepadinum</i>	-	-	-	S5
Disc Granular Lichen	<i>Lopadium disciforme</i>	-	-	-	S5
Smooth-footed Powerhorn Lichen	<i>Cladonia ochrochlora</i>	-	-	-	S5
Variable Wrinkle Lichen	<i>Tuckermannopsis orbata</i>	-	-	-	S5
Rough Speckleback Lichen	<i>Punctelia rudecta</i>	-	-	-	S5
Varied Rag Lichen	<i>Platismatia glauca</i>	-	-	-	S5
Crumpled Rag Lichen	<i>Platismatia tuckermanii</i>	-	-	-	S5
Boreal Oakmoss Lichen	<i>Evernia mesomorpha</i>	-	-	-	S5
Textured Lungwort Lichen	<i>Lobaria scrobiculata</i>	-	-	-	S5
Lungwort Lichen	<i>Lobaria pulmonaria</i>	-	-	-	S5
Smooth Lung Lichen	<i>Lobaria quercizans</i>	-	-	-	S5
Monk's Hood Lichen	<i>Hypogymnia physodes</i>	-	-	-	S5
Bottlebrush Shield Lichen	<i>Parmelia squarosa</i>	-	-	-	S5
Orange-cored Shadow Lichen	<i>Phaeophysia rubropulchra</i>	-	-	-	S5
Blue Jellyskin Lichen	<i>Leptogium cyanescens</i>	-	-	-	S5
Black-bordered Shingles Lichen	<i>Parmeliella triptophylla</i>	-	-	-	S5
Maritime Sunburst Lichen	<i>Xanthoria parietina</i>	-	-	-	S5
Appressed Jellyskin Lichen	<i>Leptogium subtile</i>	-	-	-	S3
Hammered Shield Lichen	<i>Parmelia sulcata</i>	-	-	-	S5
Hooded Rosette Lichen	<i>Physcia adscendens</i>	-	-	-	S5
Abrading Camouflage Lichen	<i>Melanelixia subaurifera</i>	-	-	-	S5
Peltigera spp.	<i>Peltigera</i> species	-	-	-	SNA
Bryoria spp.	<i>Bryoria</i> species	-	-	-	SNA
Usnea spp.	<i>Usnea</i> species	-	-	-	SNA
Ramalina spp.	<i>Ramalina</i> species	-	-	-	SNA

These lichens are considered common in the forests of Eastern Canada. Distribution of these lichens was uniform in the Project area, with most found on mature red maple trees, and a higher abundance (though still considered scarce) in wetlands and along wetland edge habitat. Lichen populations were limited in forests dominated eastern hemlock and red pine. Overall, biologists remarked on the scarcity of lichens at BHETF, which may correlate with degraded air quality in the project's vicinity.

# 3 WILDLIFE

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## 3.1 DESKTOP REVIEW

Several studies have taken place previously at the study area located in Pictou Landing, Nova Scotia. Upon review of previous studies, a data gap regarding the state of wildlife and wildlife habitat was apparent. While some reports comment briefly on terrestrial habitat makeup, they offer no remarks pertaining to the utilization of these areas by species of wildlife. The goal of WSP's assessments was to identify wildlife species and potential wildlife habitat inside the study area. A review of NSDNR's significant habitat database, and reports from the ACCDC (2017) were cross-referenced with the BHETF study area to better understand the potential for various species of wildlife at the BHETF.

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## 3.2 BASELINE PROGRAM METHODOLOGY

Data collection on various fauna species was from targeted field surveys and incidental observations. Targeted surveys were completed for wood turtles and eastern ribbonsnake. Based on a review of the geographic area and discussions with NSDNR (M. Elderkin, pers. comm., July 25 2017) it was determined that targeted field assessments for mainland moose, Canada lynx and SARA listed bat species were not required. Incidental observations were recorded for all other fauna species including other mammals, reptiles and amphibians. The goal of both the targeted surveys and incidental observations was to understand which species are present within the study area and how they are using the BHETF site.

### 3.2.1 HERPETOFAUNA

Herpetofaunal species were inventoried within the study area through both targeted searches of appropriate habitats and incidental observations. Specialized survey methods used to identify wood turtles, eastern ribbonsnake and their habitat are described below.

#### TURTLE SURVEYS

While wood turtles were the main species targeted for the surveys, areas were chosen that had high potential for cross-species observation (i.e. areas had potential for wood turtle and other species, such as snapping turtle). As such, descriptions for each species of turtle present in the province of Nova Scotia are found below.

##### **Wood Turtle (*Glyptemys insculpta*)**

The wood turtle is described as a medium-sized, semi-aquatic species, with a broad, low carapace (shell) ranging in colour from grayish-brown, to yellow. Adult wood turtles have an average carapace length of 16-25 centimetres (cm), and weigh approximately 1 kilograms (kg) (Environment Canada, 2016a). Wood turtles are known to live over 50 years in the wild, and do not reach maturity until 11-22 years. Wood turtles appear to prefer riverine habitats, with moderate flow, and clear water. Floodplains associated with riverine habitat are also frequented by this species. Forested terrestrial habitat is also utilized to a lesser extent by this species. Wood turtles are considered omnivorous, with their diet consisting of berries, leaves, mushrooms, and invertebrates (Environment Canada, 2016a).

##### **Snapping Turtle (*Chelydra serpentina*)**

The snapping turtle is described as a large freshwater species, with a rough carapace which is serrated at the rear, and ranges in colours from brown, olive green, or black. Male snapping turtles can reach a carapace length of up to approximately 50 cm, while the female's carapace rarely grows larger than 36 cm. The average weight of males is approximately 18 kg, while females average approximately 9 kg. The preferred habitat for this species is slow moving water with a soft organic or mud bottom, with dense aquatic vegetation. This includes ponds, marshes, swamps, bogs, rivers, creeks, and lake-edges (Environment Canada, 2016b). Snapping turtles are considered omnivorous and opportunistic. As such, their diet includes algae, vascular plants, mollusks, arthropods, fish,

amphibians, smaller turtles, snakes, birds, and small mammals, however it is believed that this species eats a larger amount of plant material than animal matter. Snapping turtles are known to consume both live prey, and carrion (Environment Canada, 2016b).

### **Blanding's Turtle (*Emydoidea blandingii*)**

The Blanding's turtle is described as a medium-sized semi-aquatic species, with a smooth, domed carapace coloured in dark brown or black, with yellowish spots and flecks. The most identifiable feature of the Blanding's turtle is the yellow chin and throat area. Adult Blanding's turtles can reach a carapace length of up to approximately 25 cm, and average weight for this species is measured at 1.3 kg (COSEWIC, 2016). Lifespan for this species is thought to be 70 years or more. Blanding's turtles are associated with a wide-range of aquatic habitats including swamps, bogs, fens, meadows, marshes, lakes, ponds, beaver regulated wetlands, slow flowing rivers or creeks, or man-made channels. In Nova Scotia, this species is most commonly associated with acidic streams, having tannin-rich water, and peaty soils (COSWEIC, 2016). Blanding's turtles are omnivorous, with feeding typically taking place under water. The diet of this species consists mainly of aquatic and terrestrial invertebrates, aquatic vegetation, crayfish, bivalves, fish and fish eggs, carrion, frogs, toads, tadpoles, and leeches (Royal Canadian Geographical Society, 2014).

### **Eastern Painted Turtle (*Chrysemys picta picta*)**

The eastern painted turtle is described as a small to medium-sized mostly aquatic species, with a gently rounded carapace ranging in colour from dark green to black, with red markings on the side (Canadian Herpetological Society, 2017a). Adult eastern painted turtles can reach a carapace length of 19 cm, and the adults typically weigh between 0.3 to 0.5 kg. Lifespan for this species is thought to be over 50 years in the wild. Eastern painted turtles are associated with aquatic habitats such as rivers, lakes, swamps, marshes, permanent or temporary ponds, creeks, meadows, and shoreline (Canadian Herpetological Society, 2017a). Eastern painted turtles are omnivorous, and feed on small fish, frogs, carrion, invertebrates, and a variety of plant material including algae, and water milfoil (Virginia Herpetological Society, 2018).

A review of available Species at Risk Literature outlined provincial and federally legislated protection for three of four turtle species found in the province of Nova Scotia. Of these three species, the Blanding's turtle is considered the rarest, with only a small, isolated population recorded in the south-western interior of the province. Approximately 20% of the global distribution of Blanding's turtles exist in Canada, with less than 5% occurring in Nova Scotia (Environment Canada, 2018). The wood turtle is considered the next-rarest species, and is considered Threatened by SARA and COSEWIC, however the province of Nova Scotia is thought to have the largest population of this species anywhere in Canada, with estimates ranging from 2000-7000 individuals across 35 watersheds (Environment Canada, 2016a). The snapping turtle is the third-rarest species of turtle found in the province of Nova Scotia, and is considered "Special Concern" in the Federal Species at Risk Act, and COSEWIC has identified this species as "Vulnerable". The eastern painted turtle appears to have healthy populations in Nova Scotia, and as such, is considered "Secure".

Turtle surveys were conducted on site between May and June 2018. A review of watercourse assessments completed previously by WSP (WSP, 2018a) at the BHETF was undertaken to identify any watercourses that had potential for wood turtle, based on their habitat requirements as outlined by Environment Canada (Environment Canada, 2016a). Once potential habitat was identified, WSP biologists surveyed those areas until either the project area boundary was hit, or habitat conditions declined to the point that the habitat was no longer viable for wood turtles. Conditions that were assessed to identify potential wood turtle habitat included:

- Watercourse measurements (wetted width and depth, bank-full width, bank height and composition).
- Floodplain size and conditions
- Watercourse flow and velocity
- Substrate composition and conditions
- Watercourse size and classification (i.e. Small permanent stream versus intermittent or ephemeral channel)
- Amount of near-by basking area (open canopy)
- Linear length of potential habitat
- Suitable surrounding upland habitat

- Stream specific morphological features (i.e. Oxbows, sand or gravel bars, overhanging banks, logs, etc.)
- Water quality parameters including: pH, water temperature, dissolved oxygen (mg/L and percentage), total dissolved solids, salinity, and conductivity
- Percent pools and pool quality
- Riparian vegetation composition
- Benthic invertebrate population density
- “Flashiness” of the watercourse as it relates to rapid changes in water velocity or water levels

The watercourses identified for wood turtle surveys are shown on Figure 6 located in Appendix A and include:

**WC-1:** A small permanent watercourse found in the southwest section of the Project area with an average bankfull width of 2.63 m. The assessed area is found between two wetlands, with a continuous defined channel. Fish were observed in this watercourse, but not identified (likely stickleback species). A partial barrier was observed in the reach, identified as an older inactive beaver structure. Substrate was dominated by small and large gravels as well as cobble. Wood turtle potential in this watercourse was considered moderate due to the presence of constant flow, and high amounts of gravels found in the substrate. Average depth was measured at 0.11 m, and the mix of habitat types encountered was conducive to aquatic life. In-stream cover was available in various forms, with undercut banks providing the most cover. Wetland area surrounding this reach of stream was considered adequate basking habitat for wood turtles, and the risk of flash-flood in this watercourse was considered low.

**WC-6:** An intermittent watercourse which flows in a sinuous pattern before reaching a confluence with WC-7. Beaver activity was apparent in various sites from the headwater pond and continued through most of the reach. Dry section barriers were observed in several locations, and the watercourse’s substrate consisted mostly of fine materials, which are not favourable for salmonid spawning. Average bank-full width of this watercourse was measured at 1.93 m, and a series of flow-controlled pools are apparent due to the beaver activity. Habitat quality parameters in this watercourse were considered adequate for wood turtles, and the surrounding forested upland habitat, along with the headwater pond and wetland area may be considered adequate basking habitat.

**WC-7:** An intermittent watercourse which follows an irregular meandering pattern. WC-7 had an average bank-full of 1.16 m, and an average depth of 0.04 m, however this assessment was done in the driest portion of the year, and water levels were higher at time of wood turtle assessment. This watercourse likely sees times of much higher flow during spring thaw, and runs through a very well-defined trench. WC-7 originates near the bottom of a steep hill, then flattens almost entirely. Substrate consisted mostly of fine organic or silt materials, with overhanging vegetation being the dominant cover type.

**WC-9/ WL-16:** Found in the western portion of the Project area, this watercourse is classified as a large permanent stream, with an average bank-full width of 4.99 m, and runs in a straight pattern before emptying into the Boat Harbour Stabilization Lagoon. The wetland area upstream was once used as a settling pond for the BHETF, and banks of this stream appear to have been modified from their natural form. A significant beaver structure holds water levels approximately 0.75 m higher near the edge of the upstream wetland, and substrate in this watercourse consisted of mostly of cobble and boulder sized rock, with fines interspersed as well. Average depth in this watercourse was measured at 0.33 m. the channel upstream of the beaver structure is >0.5 m deep, with substrate consisting of mostly fine materials. This channel, as well as the downstream portion below the beaver structure were assessed by biologists, and wetland 16 was assessed from vantage points that allowed for views clear of obstruction for most of the wetland. While walking the watercourse, WL-15 was also briefly checked, as the channel and this wetland are separated only by an abandoned access road.

**WC-13/ WL-18c:** Found in the north-western corner of the Project area, this watercourse is classified as intermittent, but has some small permanent characteristics. Substrate in this watercourse is dominated by fine materials, but small and large gravels were also found in patches throughout the reach. This watercourse flows in a sinuous pattern, with an average bank-full width of 1.58 m. The upstream most section of the assessed reach is found on a hillside with a steep gradient and sudden elevation changes. Once off the hill, the watercourse gradient flattens significantly before entering the Boat Harbour Stabilization Lagoon, and the average wetted depth was measured at 0.09 m. The surrounding wetland area (WL-18c) was also assessed for wood turtle presence by assessors during surveys. This wetland is classified as a swamp/marsh complex, with no surface water features other

than WC-13. Open canopy areas are apparent in scattered sections of this wetland which may be adequate for wood turtle basking sites.

**WC-17/ WL-23a:** Found in the eastern section of the Project area, this watercourse is classified as a small permanent stream, with an average bank-full width of 1.54 m. This watercourse has a well-defined, deep channel that runs mostly through a wetland in the Project area. Average water depth was measured at 0.33 m. The channel experiences braiding and standing water in the wetland section near the entrance to the Boat Harbour Stabilization Lagoon. Substrate in this watercourse was mostly fine materials, and undercut banks were noted along several sections of the assessed reach. The surrounding wetland area (WL-23a) was also assessed for wood turtle presence by biologists during surveys. This wetland is classified as a fringe swamp/marsh complex, consisting mostly of cattails and other water loving vegetation. Ample basking areas were identified at the edges of this wetland.

**WL-7:** Wetland 7 is considered a swamp/marsh complex with ample surface water. Surrounding this wetland on three sides is forested upland habitat, with a large field found beyond the forested section on the southern edge of the wetland. The eastern edge of this wetland is bordered by a gravel access road, which may be utilized for basking. Average depth of water in this wetland is >0.5 m, and features such as submerged logs are apparent. Vegetation in this wetland is dominated by cattails (*Typha* sp.), and other water loving vegetation. Biologists walked the edge of this wetland, and conducted visual surveys on basking locations inside the wetland, such as logs or rocks protruding from the water.

**WL-13b:** Similar to Wetland 7, this wetland is considered a swamp/marsh complex, but is surrounded on all sides by gravel access roads. Water depth in this wetland is thought to exceed 0.5 m, and vegetation in this wetland is dominated by cattails. This wetland was previously used as a settling pond from 1967-1972, and as such, may contain contaminants in the sediment. Assessors walked the edge of this wetland in its entirety, and also visually observed features in the central wetland area to ensure any basking turtles were observed while perched on features protruding from the water.

Photos of the selected turtle survey locations are available in Appendix C.

## SNAKE SURVEYS

While the eastern ribbonsnake (*Thamnophis sauritus pop. 3*) was the main species targeted for the surveys, areas were chosen that had high potential for cross-species observation. There are five species of snake that are native to Nova Scotia, these include: eastern ribbonsnake – Atlantic population, northern ringneck snake (*Diadophis punctatus edwards*), the maritime garter snake (*Thamnophis sirtalis palidula*), eastern smooth green snake (*Opheodrys vernalis vernalis*), and northern redbelly snake (*Storeria occipitomaculata occipitomaculata*). The eastern ribbonsnake as the sole species with provincial and or federally legislated protection residing in Nova Scotia. All other snake species outlined in this report are considered secure in the province of Nova Scotia, with healthy population sizes.

Descriptions for each species of snake present in the province of Nova Scotia are found below.

### **Eastern Ribbonsnake – Atlantic Population (*Thamnophis sauritus pop. 3*)**

The eastern ribbonsnake is a semi-aquatic reptile species often associated with open wetland areas or quiet, slow moving watercourses or waterbodies. Like all other reptiles, this species is ectothermic, and utilizes open areas or up-land areas for thermoregulation, usually in close proximity to a wetland or waterbody. This species has been encountered in bushes up to 2 metres from ground level to bask. The eastern ribbonsnake is identifiable by its overall dark brown to black appearance, with three yellow stripes running the length of its body, one on each of its sides, and one down the middle of its back. The underbelly of the eastern ribbonsnake is light coloured and free of markings, and a small, light coloured “stripe” is found directly in front of each eye (Environment Canada, 2018b). Diet of this species consists mainly of amphibians, and small fish. This species is not widespread, with the only recorded occurrences in a concentrated area of the southeast interior portion of the province, where most sightings occur in the Mersey and Medway river watersheds respectively (Environment Canada, 2018b).

### **Northern Ringneck Snake (*Diadophis punctatus edwards*)**

This species of snake is easily identifiable due to the yellow or cream coloured “ring” around its neck. The body of a northern ringneck snake is usually dark grey, brown, or black in color, and its scales are smooth. Size range for this

species averages 25-38 cm in length, however specimens longer than 50 cm have been observed (Mills, 1997). Ring necked snakes prefer areas with shallow soils and surface bedrock. They are often found under rocks, logs, or bark. Wetland edge habitat is also utilized by this species, as their diet consists mainly of amphibians, especially red-backed salamanders (*Plethodon cinereus*) (Canadian Herpetological Society, 2017b).

#### **Maritime Garter Snake (*Thamnophos sirtalis palidula*)**

This species has significant variation in color patterns, but identifiable by its brown, dark green, or black base colour, with two light coloured stripes down each side, a dorsal stripe running down its back, and two rows of alternating dark squares on its back. The maritime garter snake is the largest found in the province of Nova Scotia, with adults averaging 46-66 cm in length, but can grow up to 90 cm (Mills, 1997). This species is considered a generalist in relation to habitat, the areas where maritime garter snakes are commonly found include wetlands, wetland edge, forested upland, shrublands, rocky areas, and urban areas. Like other snake species, the maritime garter snake commonly utilizes the underside of rocks or logs to provide cover or aid in thermoregulation. Wetland areas are utilized most commonly for foraging, as this species' diet consists of amphibians, small fish, earthworms, and rodents (Canadian Herpetological Society, 2017c).

#### **Eastern Smooth Green Snake (*Opheodrys vernalis vernalis*)**

This species is easily identifiable due to its bright emerald green coloring, with a lighter coloured belly area, and can grow up to 79 cm in length, however most adults are less than 50 cm. The eastern smooth green snake is commonly found in meadows, grassy roadsides, bogs, and alongside rivers or streams (Mills, 1997). This species is an insectivore, and eats caterpillars, spiders, crickets, and other insects. Eastern smooth green snakes are considered widespread throughout the province (NSMONH, 2018).

#### **Northern Redbelly Snake (*Storeria occipitomaculata occipitomaculata*)**

This species is identifiable due to its orange or red belly, with a brown, grey, or black upper side, and is commonly found in grassy areas along streams, ponds, or lakes (Mills, 1997). The northern redbelly snake is considered primarily nocturnal, and its diet consists mainly of invertebrates such as slugs, earthworms, snails, grubs, and other insects (Canadian Herpetological Society, 2017d).

Snake surveys were completed at the BHETF between May 2018, and July 2018. A review of wetland assessments completed at the BHETF by WSP (WSP, 2018b) was completed prior to the commencement of snake surveys to help identify areas where the potential for snakes were apparent. Once potential habitat areas were identified, Biologists laid survey materials in those locations. Locations were chosen using the following criteria:

- Amount of available basking area
- Proximity to wetland, watercourse, or other surface water feature.
- The aspect of available basking areas (i.e. northern aspect vs southern aspect)
- Proximity to open, rocky areas such as roadsides or rock outcrops
- Habitat availability for prey species
- Low canopy closure
- Amount of “edge” habitat in the area between different vegetation height classes
- Areas suitable for more than one species of snake, to help increase the effectiveness of the surveys.

All wetland areas identified at the BHETF were reviewed and considered for snake surveys, however only those that matched survey location criteria were brought forth to the survey program. The locations identified for snake surveys are shown on Figure 7 located in Appendix A and include:

**WL-5a (20 pads):** This wetland is classified as a swamp/marsh complexes found in the southern section of the Project area, and has an approximate area of 2.17 hectares (ha). A watercourse (WC-1) is associated with this wetland and runs in a northerly direction. In the marsh area there are snags with the herbaceous layer dominated by rice cutgrass, with pockets of cattails, pockets of various sedges and pockets of burreed depending on the depth of water. In the swamp, the treed stratum is dominated by red maple, and speckled alder in the sapling/shrub layer. Upland Edge of this wetland is open, with ample sunlight hitting the herbaceous layer, creating adequate basking habitat.

**Field Near WL-7 (10 pads):** This area is a grassy hillside found roughly 25 m away from the edge of a wetland inundated with water. This field habitat is separated from the wetland habitat by a thin strip of coniferous trees. The survey location is open, and receives ample amounts of sunlight. The combination of open basking habitat, and proximity to wetland area led assessors to include this location in the snake survey program. A gravel road runs along the eastern edge of WL-7, which was also assessed for snakes.

**WL-10 (20 pads):** This wetland is classified as a swamp/marsh complex found in the southern section of the Project area, and has an approximate area of 2.18 ha. Two watercourses are associated with this wetland, with WC-5 flowing into the wetland, and the headwaters of WC-6 flowing out of this wetland. A pond measuring approximately 0.26 ha is also apparent in this wetland area. The dominant tree stratum in the swamp portion of the wetland are red maple and balsam fir with speckled alder dominating the shrub sapling stratum. The dominant herbaceous species are cinnamon fern and sensitive fern. In the marsh portion of the wetland, cattails and pondweed dominate the herbaceous stratum. An open area found just upslope of the pond was used as the survey location, as vegetation was low, and sunlight hit the area un-obstructed.

**WL-13a (20 pads):** This wetland is classified as a swamp/marsh complex found in the western section of the Project area, and has an approximate area of 26 ha. The swamp portion of this wetland complex is dominated by red maple in the tree stratum and speckled alder in the shrub/sapling stratum. The dominant herbaceous species are cinnamon fern and sensitive fern. In the marsh portion of the wetland, cattails are the dominant herbaceous species. This wetland was previously used as a settling pond for effluent, and is known to contain residual chemicals or contaminants that could potentially affect the wetland's function. This wetland has abundant open-areas with ample sunlight for basking, and is one of the largest wetlands found at the BHETF.

**WL-16 (20 pads):** This wetland is classified as a marsh found in the northwestern section of the Project area, and has an approximate area of 15.61 ha. Along the perimeter of the marsh, the dominant tree species are red maple and balsam fir with grey birch, and steplebush dominating sapling/shrub species. Cattails are the dominant herbaceous species. This wetland was previously used as a settling pond for effluent, and is known to contain residual chemicals or contaminants that could potentially affect the wetland's function. The adjacent wetland (WL-15) also had desirable conditions for snake surveys and because of this, the survey location was selected in a central area between the two wetlands on an abandoned road separating the two.

**WL-20c (10 pads):** This wetland is classified as swamp/marsh complexes found on the fringe of the Boat Harbour Stabilization Lagoon in the northern section of the Project area, and has an approximate area of 2.03 ha. An ephemeral watercourse (WC-14) is associated with this wetland is found on the wetland's northern edge, and flows in a southerly direction. Within the swamp portion of the wetland areas, grey birch is the predominant tree species and sapling/shrub stratum, and sensitive fern is the dominant herbaceous species. Within the marsh portion of the wetland, cattails are the predominant herbaceous species. Near the upland edge of this wetland is a belt of herbaceous vegetation with an open canopy and a gentle hillslope with a southern aspect and ample sunlight.

**WL-23a (15 pads):** This wetland is classified as swamp/marsh complexes found in the eastern section of the Project area, and have a combined approximate area of 1.37 ha. Two watercourses (WC-17 & WC-18) are associated with these wetlands, and both run in a northwesterly direction. Within the swamp portion of the wetland, the dominant tree species are grey birch and red maple with the sapling/shrub stratum dominated by grey birch saplings and speckled alder. Within the marsh portion of the wetland the dominant herbaceous species are cattail and rushes. The area at the northern edge of this wetland is largely open and receives ample sunlight. As such, this wetland was included in the snake survey program.

Photos of the selected snake survey points, and results of the surveys can be found in Appendix C.

### **3.2.2 INCIDENTAL OBSERVATIONS**

Incidental observations of mammals and various signs of mammals across the study area were documented and photographed during all field surveys. Signs included features such as dens and nests, scat, tracks, forage evidence, beaver activity, animal remains and visual sightings of wildlife species. Mammal observations were collected throughout the field season in 2017 and 2018. Incidental observations for priority reptiles and amphibians occurred during all field programs, particularly wetland and watercourse delineation, and fish habitat surveys.

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## 3.3 BASELINE CONDITIONS

Results from species specific surveys, and incidental observations are outlined in this section. Species specific surveys were performed in spring and early summer months of 2018, however incidental observation data has been collected since the commencement of natural science field work in the Summer of 2017.

### 3.3.1 TURTLE SURVEYS

Wood turtle surveys were completed between the months of May and June, 2018 and included four site visits, with eight locations surveyed during each visit. Surveys were completed during daylight hours, when air temperature was higher than that of the water associated with the survey locations. Biologists walked along the targeted surface water feature (watercourse or ponded wetland), and assessed both the water feature itself, and the surrounding area within 20 m.

A desktop review of the habitat available on site was cross-referenced with the NSDNR Significant Habitat Mapping database to identify areas of heightened potential for wood turtles, however a review of the aforementioned database revealed no significant habitat in the BHETF study area.

No wood turtles were observed at BHETF during the duration of the field survey program, this is likely due to the lack of preferred habitat conditions for this species, as watercourses at boat harbour are considered relatively small in comparison to watercourses in the surrounding area that are known to be wood turtle habitat.

### 3.3.2 SNAKE SURVEYS

Snake surveys were completed during the months of May and June 2018 and included four visits, with seven locations surveyed during each visit. Surveys were completed during daylight hours on days where the temperature had exceeded 15°C prior to the commencement of work. Surveys were conducted during hours of peak activity for snakes, and surveyors made efforts to inspect basking pads from afar before investigating closer, to minimize the risk of flushing or driving snakes away.

Three maritime garter snakes were identified during the field program at the BHETF. One individual was encountered at Snake Point 2, near WL-7. This snake was found roughly 2 m from the area where the basking pads were placed. The two other maritime garter snakes were encountered at Snake Point 1, and Wetland 20b respectively.

One ring-necked snake was encountered by observers at Snake Point 1 during the June 27<sup>th</sup>, 2018 trip. This individual was thought to be immature, and was measured at approximately 15 – 20 cm in length. Assessors refrained from handling the individual to minimize risk of injury or stress.

Of the five species of snake found in the province of Nova Scotia, only one is considered at risk; the Eastern Ribbonsnake – Atlantic population. This species is not widespread, with the only recorded occurrences in a concentrated area of the southeast interior portion of the province, where most sightings occur in the Mersey and Medway river watersheds respectively (Parks Canada Agency, 2012). No Eastern Ribbonsnakes were encountered during assessments at the BHETF.

### 3.3.3 INCIDENTAL OBSERVATIONS

WSP's field program consisted of several types of in-field natural science related surveys and assessments. As such, field staff were able to visit the site in its entirety, and incidentally encountered several wildlife species during these efforts. The table below details each species encountered by field staff either through visual or auditory confirmation of the species, or through evidence left behind such as tracks, scat, or obvious browse. Harvested wildlife remains were found in several areas of the site, likely discarded by hunters from the local area. These specimens were disregarded, as they were likely encountered in areas off site, and non-harvestable remains (skin, bones, fur) were discarded along access roads and ATV trails throughout the site.

TABLE 3.1: INCIDENTAL OBSERVATIONS AT BHETF

COMMON NAME	SCIENTIFIC NAME	COSEWIC	SARA	NSESA	S-RANK	GS-RANK	OBSERVATION
Northern Raccoon	<i>Procyon lotor</i>	-	-	-	S5	4 Secure	Scat and Tracks
Striped Skunk	<i>Mephitis mephitis</i>	-	-	-	S5	4 Secure	Visual and Odour ID
Snowshoe Hare	<i>Lepus americanus</i>	-	-	-	S5	4 Secure	Visual ID
White-tailed Deer	<i>Odocoileus virginianus</i>	-	-	-	S5	4 Secure	Visual ID
Eastern Coyote	<i>Canis latrans</i>	-	-	-	S5	4 Secure	Scat and Tracks
Red Fox	<i>Vulpes vulpes</i>	-	-	-	S5	4 Secure	Tracks
Woodland Jumping Mouse	<i>Napaeozapus insignis</i>	-	-	-	S5	4 Secure	Visual ID
Meadow Jumping Mouse	<i>Zapus hudsonius</i>	-	-	-	S5	4 Secure	Visual ID
American Black Bear	<i>Ursus americanus</i>	-	Not At Risk	-	S5	4 Secure	Scat and Tracks
Common Muskrat	<i>Ondatra zibethicus</i>	-	-	-	S5	4 Secure	Visual ID
American Beaver	<i>Castor canadensis</i>	-	-	-	S5	4 Secure	Visual ID and Several Lodges
Northern Short-tailed Shrew	<i>Blarina brevicauda</i>	-	-	-	S5	4 Secure	Visual ID
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	-	-	-	S5	4 Secure	Visual and Auditory ID
Eastern Chipmunk	<i>Tamias striatus</i>	-	-	-	S5	4 Secure	Visual and Auditory ID
Maritime Garter Snake	<i>Thamnophis sirtalis pallidulus</i>	-	-	-	S5	4 Secure	Visual ID
Wood Frog	<i>Lithobates sylvaticus</i>	-	-	-	S5	4 Secure	Visual ID
Spring Peeper	<i>Pseudacris crucifer</i>	-	-	-	S5	4 Secure	Auditory ID
Spotted Salamander	<i>Ambystoma maculatum</i>	-	-	-	S5	4 Secure	Visual ID
Eastern Red-Backed Salamander	<i>Plethodon cinereus</i>	-	-	-	S5	4 Secure	Visual ID
American Toad	<i>Anaxyrus americanus</i>	-	-	-	S5	4 Secure	Visual ID

None of the wildlife species identified incidentally at the BHETF are considered SAR/SOCC, with all populations designated as secure. Photos of several incidentally observed species are available in Appendix C.

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## 3.4 WILDLIFE AND WILDLIFE HABITAT DISCUSSION

The forest inventory identified at the BHETF lends itself to a variety of wildlife species, as conditions are varied throughout the site. Several wetland areas and wetland edge were considered adequate habitat for herptile species such as snakes, turtles, frogs, toads, and salamanders. Species identified in wetland areas included wood frog, red-backed salamander, yellow spotted salamander, ring-necked snake, and maritime garter snake. Other species such as bullfrog, pickerel frog, green frog, mink frog, spring peeper, and the American toad are all potential inhabitants of the wetland areas found at the BHETF.

Mammals such as the white-tailed deer, porcupine, striped skunk, and raccoon were all present in several areas of the BHETF, which is to be expected, as these species are considered habitat generalists, who utilize a variety of forest types and wetland areas. Other mammals identified at the BHETF include the black bear, coyote, red fox, and rodents such as the red squirrel, woodland jumping mouse, chipmunk, beaver, muskrat, and possibly groundhog.

There was no evidence of species at risk such as the mainland moose, or Canada lynx on site. Moose carcasses were noted in two areas on site, but these are believed to be Cape Breton moose, which were encountered and legally harvested somewhere else. Non-harvestable materials were then discarded along access trails at the BHETF. A section of lower jaw was absent at both carcass sites, which provides evidence that the lower jaw was likely sent to NSDNR for population modelling which is consistent with responsible, lawful harvesting (A. Young, NSDNR, Pers. Comm., June 19, 2018).

Plant communities at the BHETF are considered normal for Nova Scotia, with common species such as starflower, and wild lily of the valley found at nearly every site. Each area of the site was investigated thoroughly for rare plants, and spring ephemeral surveys indicated no heightened potential for harmful effects to SAR plant species. As mentioned above, the black ash found at the BHETF is likely planted, as the area where this species was found coincides with a mapped area of black ash reforestation activities (Jacques Whitford, 2004a).

## 4 CLOSURE

*This report was prepared by WSP Canada Inc. for the account of the GHD. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP's best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.*

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This report has been prepared by Brady Leights, B.Et., Dip.R.M., E.Pt. Internal senior technical review has been provided by Christina LaFlamme, M.Sc., EP. Technical limitations associated with the report can be found in Appendix D.

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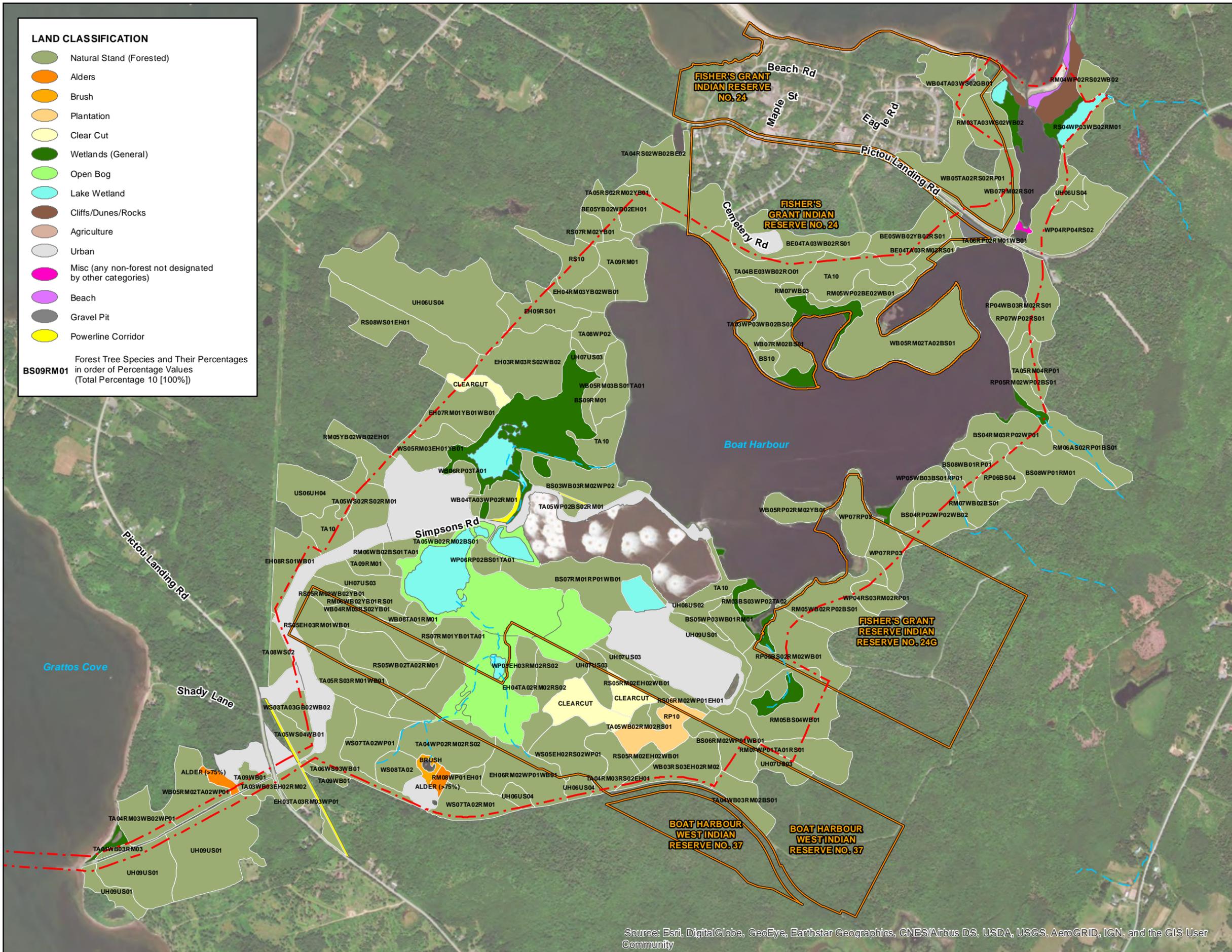
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# APPENDIX

## A FIGURES

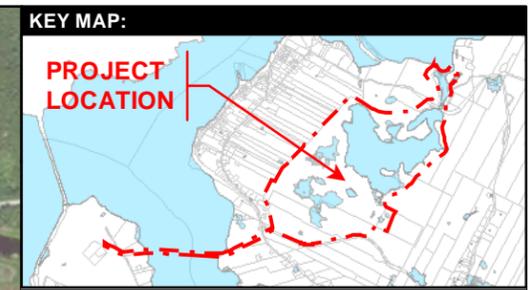




**LAND CLASSIFICATION**

- Natural Stand (Forested)
- Alders
- Brush
- Plantation
- Clear Cut
- Wetlands (General)
- Open Bog
- Lake Wetland
- Cliffs/Dunes/Rocks
- Agriculture
- Urban
- Misc (any non-forest not designated by other categories)
- Beach
- Gravel Pit
- Powerline Corridor

**BS09RM01** Forest Tree Species and Their Percentages in order of Percentage Values (Total Percentage 10 [100%])



**LEGEND:**

- WATERCOURSE (GHD)
- FIRST NATIONS TERRITORY BOUNDARY
- BOAT HARBOUR STUDY AREA BOUNDARY

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**PROJECT:**  
PROJECT: **BOAT HARBOUR REMEDIATION PLANNING AND DESIGN**

PROJECT NO.: **171-10478**

CLIENT:

**FIGURE:**  
TITLE: **NSDNR LAND CLASSIFICATION**

FIGURE NO.: **1** REVISION NO.: **0**

SCALE: 1:15,000  
0 200 400 800 Metres

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 20 NORTH

DRAWN BY: T. MOREHOUSE CHECKED BY: C. LAFLAMME

CREATED DATE: (YYYY-MM-DD) 2018-07-31 REVISION DATE: (YYYY-MM-DD) 2018-08-01

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**KEY MAP:**

**LEGEND:**

- WATERCOURSE (GHD)
- FIRST NATIONS TERRITORY BOUNDARY
- BOAT HARBOUR STUDY AREA BOUNDARY

**SIGNIFICANT HABITAT**

- MIGRATORY BIRD
- SPECIES AT RISK
- OTHER HABITAT

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**PROJECT:**

PROJECT: **BOAT HARBOUR REMEDIATION PLANNING AND DESIGN**

PROJECT NO.: **171-10478**

CLIENT:

**FIGURE:**

TITLE: **NSDNR SIGNIFICANT SPECIES AND HABITAT**

FIGURE NO.: **2** REVISION NO.: **0**

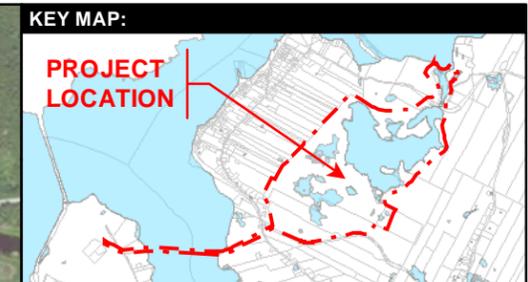
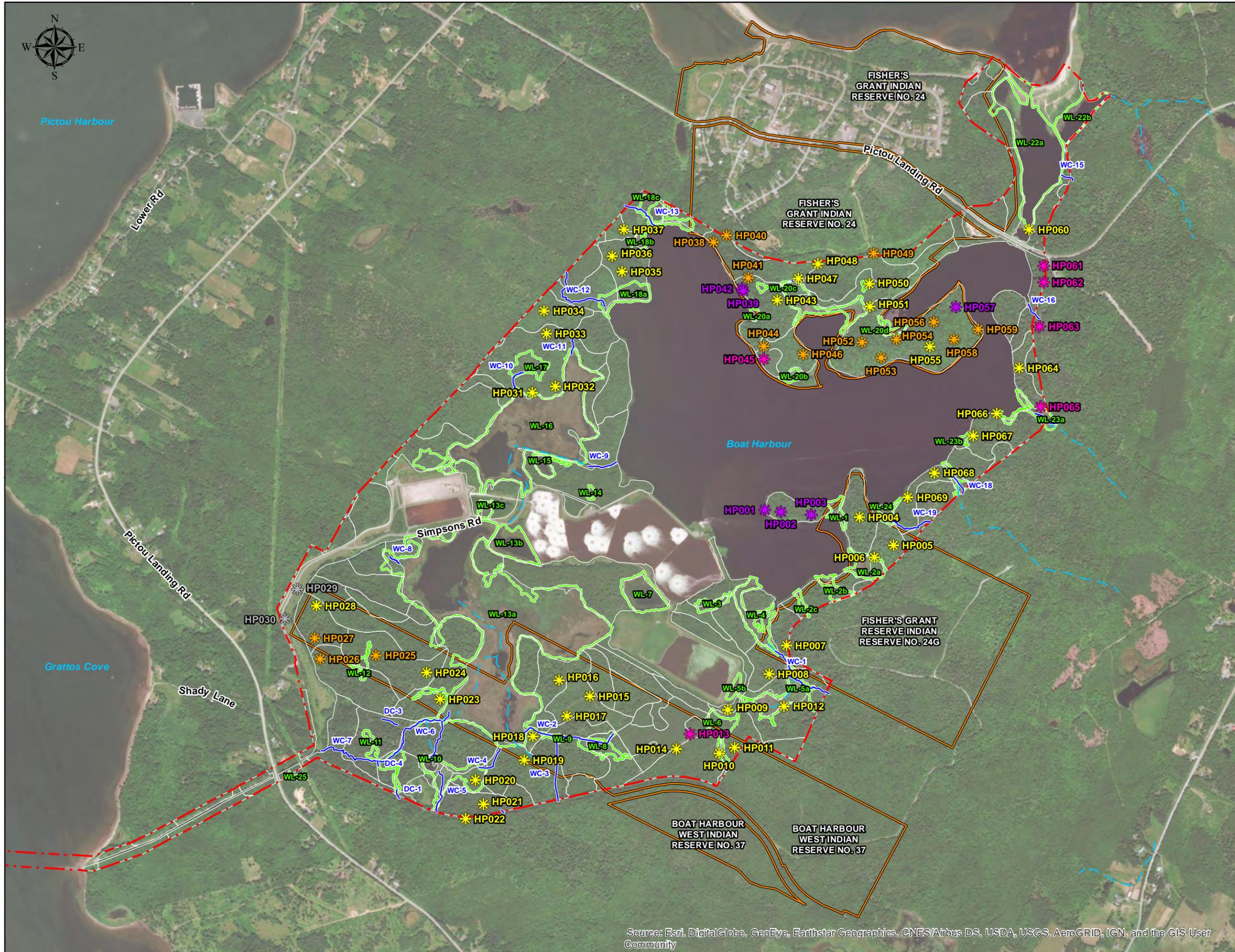
SCALE: 1:20,000  
0 200 400 800 Metres

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 20 NORTH

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**LEGEND:**

**HABITAT SURVEY POINTS ECOSITE CLASSIFICATION**

- AC10
- AC13
- AC2
- AC6
- N/A (ANTHROPOGENIC VEGETATION TYPE)

FIELD DELINEATED WATERCOURSE (WSP, 2017)  
(WC - watercourse; DC - drainage channel)

FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017)

WATERCOURSE (GHD)

FIRST NATIONS TERRITORY BOUNDARY

BOAT HARBOUR STUDY AREA BOUNDARY

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**PROJECT:**  
PROJECT: **BOAT HARBOUR REMEDIATION PLANNING AND DESIGN**

PROJECT NO.: **171-10478**

CLIENT:

**FIGURE:**  
TITLE: **HABITAT SURVEY**

FIGURE NO.: **3** REVISION NO.: **0**



DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 20 NORTH

DRAWN BY: T. MOREHOUSE CHECKED BY: C. LAFLAMME

CREATED DATE: (YYYY-MM-DD) 2018-07-31 REVISION DATE: (YYYY-MM-DD) 2018-08-01

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**KEY MAP:**

**LEGEND:**

**SPECIES OF CONSERVATION CONCERN**

- BLACKASH
- HEART-LEAVED FOAM FLOWER

FIELD DELINEATED WATERCOURSE (WSP, 2017)  
(WC - watercourse; DC - drainage channel)

FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017)

WATERCOURSE (GHD)

FIRST NATIONS TERRITORY BOUNDARY

BOAT HARBOUR STUDY AREA BOUNDARY

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**PROJECT:**  
PROJECT: **BOAT HARBOUR REMEDIATION PLANNING AND DESIGN**

PROJECT NO.: **171-10478**

CLIENT:

**FIGURE:**  
TITLE: **PLANT SPECIES AT RISK AND SPECIES OF CONSERVATION CONCERN**

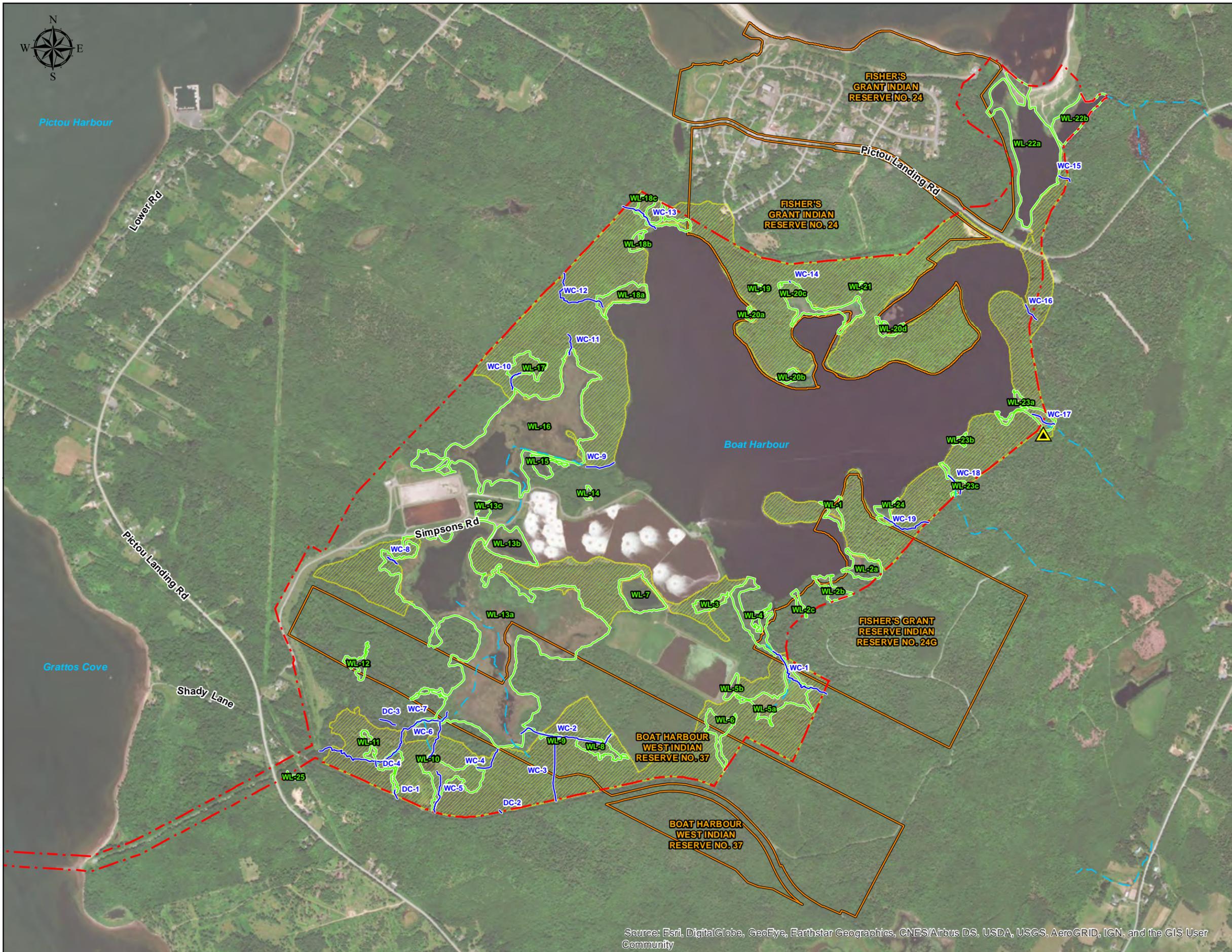
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SCALE: 1:15,000

DATUM:	NAD 83 CSRS	PROJECTION:	UTM ZONE 20 NORTH
DRAWN BY:	T. MOREHOUSE	CHECKED BY:	C. LAFLAMME
CREATED DATE: (YYYY-MM-DD)	2018-07-31	REVISION DATE: (YYYY-MM-DD)	2018-08-01

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**KEY MAP:**

**LEGEND:**

- Leptogium subtile*
- LICHEN SURVEY
- FIELD DELINEATED WATERCOURSE (WSP, 2017) (WC - watercourse; DC - drainage channel)
- FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017)
- WATERCOURSE (GHD)
- FIRST NATIONS TERRITORY BOUNDARY
- BOAT HARBOUR STUDY AREA BOUNDARY

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**PROJECT:**  
PROJECT: **BOAT HARBOUR REMEDIATION PLANNING AND DESIGN**

PROJECT NO.: **171-10478**

CLIENT:

**FIGURE:**  
TITLE: **LICHEN SURVEY**

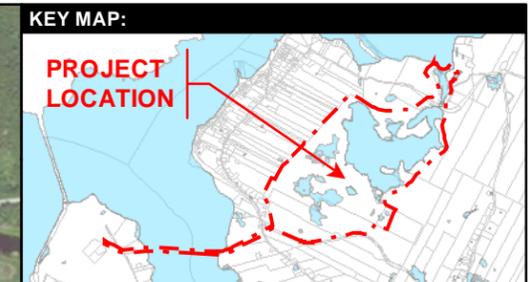
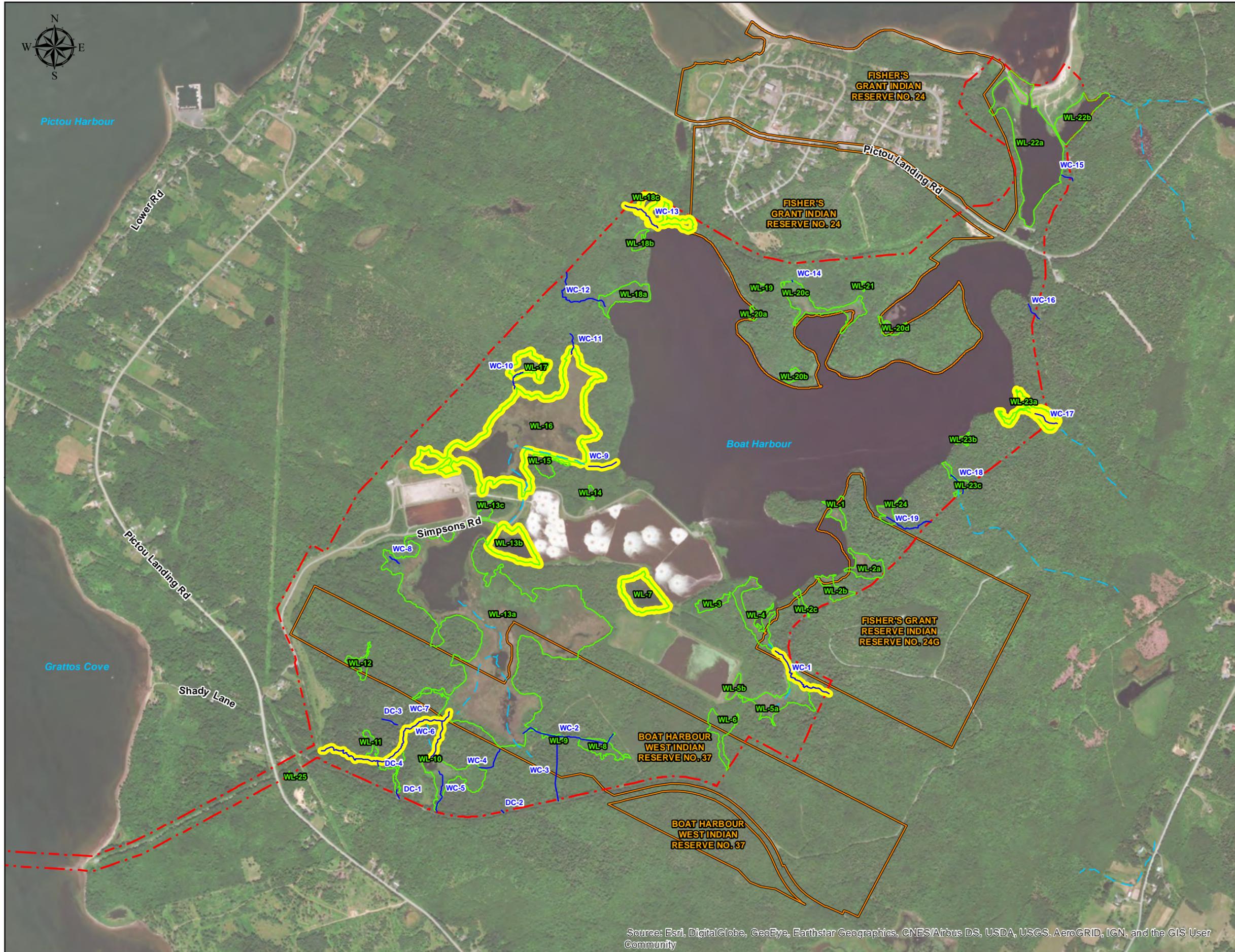
FIGURE NO.:	<b>5</b>	REVISION NO.:	<b>0</b>
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SCALE: 1:15,000  
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DATUM:	NAD 83 CSRS	PROJECTION:	UTM ZONE 20 NORTH
DRAWN BY:	T. MOREHOUSE	CHECKED BY:	C. LAFLAMME
CREATED DATE: (YYYY-MM-DD)	2018-07-31	REVISION DATE: (YYYY-MM-DD)	2018-08-01

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**LEGEND:**

- TURTLE SURVEY LOCATIONS
- FIELD DELINEATED WATERCOURSE (WSP, 2017) (WC - watercourse; DC - drainage channel)
- FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017)
- WATERCOURSE (GHD)
- FIRST NATIONS TERRITORY BOUNDARY
- BOAT HARBOUR STUDY AREA BOUNDARY

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**PROJECT:**  
 PROJECT: **BOAT HARBOUR REMEDIATION PLANNING AND DESIGN**

PROJECT NO.: **171-10478**

CLIENT:

**FIGURE:**  
 TITLE: **TURTLE SURVEY**

FIGURE NO.: **6** REVISION NO.: **0**

SCALE: 1:15,000  
 0 200 400 800 Metres

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 20 NORTH

DRAWN BY: T. MOREHOUSE CHECKED BY: C. LAFLAMME

CREATED DATE: (YYYY-MM-DD) 2018-07-31 REVISION DATE: (YYYY-MM-DD) 2018-08-01



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**KEY MAP:**

**LEGEND:**

- SNAKE POINT
- FIELD DELINEATED WATERCOURSE (WSP, 2017) (WC - watercourse; DC - drainage channel)
- FIELD DELINEATED WETLAND BOUNDARY (WSP, 2017)
- WATERCOURSE (GHD)
- FIRST NATIONS TERRITORY BOUNDARY
- BOAT HARBOUR STUDY AREA BOUNDARY

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**PROJECT:**  
PROJECT: **BOAT HARBOUR REMEDIATION PLANNING AND DESIGN**

PROJECT NO.: **171-10478**

CLIENT:

**FIGURE:**  
TITLE: **SNAKE SURVEY**

FIGURE NO.:	<b>7</b>	REVISION NO.:	<b>0</b>
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SCALE: 1:15,000  
0 200 400 800 Metres

DATUM:	NAD 83 CSRS	PROJECTION:	UTM ZONE 20 NORTH
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# APPENDIX

## **B** MASTER PLANT LIST

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSESA
<i>Abies balsamea</i>	Balsam Fir	2017, 2018	General, upland, Wetland	4 Secure	S5	-
<i>Acer pensylvanicum</i>	Striped Maple	2017,2018	Upland, Shaded	4 Secure	S5	-
<i>Acer rubrum</i>	Red Maple	2017,2018	General, Upland, Wetland	4 Secure	S5	-
<i>Acer saccharum</i>	Sugar Maple	2017,2018	Upland, Shaded	4 Secure	S4S5	-
<i>Achillea millefolium</i> var. <i>borealis</i>	Boreal Yarrow	2017,2018	Disturbed Areas, Forest	4 Secure	S4	-
<i>Achillea millefolium</i>	Common Yarrow	2017, 2018	Grassland, Upland, Disturbed Areas	4 Secure	S4	-
<i>Actaea pachypoda</i>	White Baneberry	2017-2018	Upland Forest	4 Secure	S4	-
<i>Actaea rubra</i>	Red Baneberry	2018	Upland Forest	4 Secure	S5	-
<i>Agrimonia striata</i>	Woodland Agrimony	2017	Open woods, Thickets,	4 Secure	S5	-
<i>Agrostis perennans</i>	Upland Bent Grass	2017	Grassland, Upland, Disturbed Areas	4 Secure	S4S5	-
<i>Agrostis scabra</i>	Rough Bentgrass	2017, 2018	Generalist	4 Secure	S5	-
<i>Alnus incana</i>	Speckled Alder	2017, 2018	Disturbed, Wetland	4 Secure	S5	-
<i>Alnus viridis</i>	Green Alder	2017, 2018	Shaded, Wetland, Generalist	4 Secure	S5	-
<i>Amelanchier spp.</i>	Serviceberry	2017,2018	Upland, Wetland margins	4 Secure	S4S5	-
<i>Andropogon virginicus</i>	Broom Sedge	2017, 2018	Uplands, Disturbed Areas, Field	4 Secure	S5	-
<i>Anthoxanthum odoratum</i>	Large Sweet Vernal Grass	2017	Meadows, Field	7 Exotic	SNA	-
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	2017, 2018	Upland forests, Wetland areas	4 Secure	S5	-
<i>Athyrium filix-femina</i>	Common Lady Fern	2017, 2018	Moist to wet forested thickets and along streambanks	4 Secure	S5	-
<i>Atriplex laciniata</i>	Belgian Orache	2018	Coastal, Beach	7 Exotic	SNA	-
<i>Barbarea vulgaris</i>	Yellow Rocket	2018	Meadow, Field, Manmade, Shoreline	7 Exotic	SNA	-
<i>Betula alleghaniensis</i>	Yellow Birch	2017, 2018	Near water, Wetlands, Shaded	4 Secure	S5	-
<i>Betula papyrifera</i>	White Birch	2017, 2018	Upland forest, Open areas, Wetland edge	4 Secure	S5	-
<i>Betula populifolia</i>	Gray Birch	2017, 2018	Disturbed areas, Roadside,	4 Secure	S5	-

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSEA
			Clearings, Wetland edge			
<i>Bidens frondosa</i>	Devil's Beggarticks	2017	Wet areas	4 Secure	S5	-
<i>Brachyelytrum septentrionale</i>	Northern Shorthusk	2017	Hardwood forests	4 Secure	S5	-
<i>Bromus inermis</i>	Smooth Brome	2017	Disturbed areas, Roadside, Field	7 Exotic	SNA	-
<i>Chenopodium pratericola</i>	Goosefoot	2017	Open areas, Upland forests, Roadsides	7 Exotic	SNA	-
<i>Calamagrostis canadensis</i>	Bluejoint Grass	2017, 2018	Generalist, Uplands, Wetlands, Field, Meadow	4 Secure	S5	-
<i>Cardamine pensylvanica</i>	Pennsylvania Bittercress	2018	Moist forest, Riparian areas, Wet areas	4 Secure	S5	-
<i>Carex brunnescens</i>	Brownish Sedge	2018	Moist forest, Riparian areas, Shaded	4 Secure	S5	-
<i>Carex crinita</i>	Fringed Sedge	2017, 2018	Wet areas	4 Secure	S5	-
<i>Carex canescens</i>	Silvery Sedge	2018	Wet areas	4 Secure	S5	-
<i>Carex debilis</i>	Weak Sedge	2017, 2018	Disturbed areas, Floodplain, Wetlands, Shoreline	4 Secure	S5	-
<i>Carex intumescens</i>	Bladder Sedge	2017, 2018	Upland forest, Wetland edge	4 Secure	S5	-
<i>Carex lupulina</i>	Hop Sedge	2017, 2018	Wet areas, Shoreline	4 Secure	S3	-
<i>Carex lurida</i>	Sallow Sedge	2017, 2018	Wet areas	4 Secure	S5	-
<i>Carex oligosperma</i>	Few Seeded Sedge	2017	Wet areas, Field	4 Secure	S5	-
<i>Carex pseudocyperus</i>	Cyperuslike Sedge	2017	Wet areas	4 Secure	S4S5	-
<i>Carex stipata</i>	Awl-fruited Sedge	2018	Disturbed areas, Riparian areas, Meadow, Field	4 Secure	S5	-
<i>Carex trisperma</i>	Three-seeded Sedge	2017, 2018	Forest, Wet areas	4 Secure	S5	-
<i>Carex vesicaria</i>	Inflated Sedge	2017	Wetland	4 Secure	S4	-
<i>Chelone glabra</i>	Turtlehead	2017, 2018	Wet areas	4 Secure	S5	-
<i>Chimaphila umbellata</i>	Common Pipsissewa	2017, 2018	Upland forest, Shaded areas	4 Secure	S4	-
<i>Chrysosplenium americanum</i>	American Golden Saxifrage	2018	Riparian areas, Wet areas, Wetland edge	4 Secure	S5	-
<i>Circaea alpina</i>	Small Enchanters Nightshade	2017, 2018	Wet areas, riparian areas, forest	4 Secure	S5	-
<i>Clintonia borealis</i>	Yellow Bluebead Lily	2017, 2018	Upland forest, Wetland edge	4 Secure	S5	-
<i>Comarum palustre</i>	Marsh Cinquefoil	2017, 2018	Wet areas	4 Secure	S5	-
<i>Convolvulus arvensis</i>	Wild Morning Glory	2017, 2018	Field, Roadside, Open forest	7 Exotic	SNA	-

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSEA
<i>Coptis Trifolia</i>	Goldthread	2017, 2018	Wet areas	4 Secure	S5	-
<i>Corallorhiza trifida</i>	Early Coralroot	2018	Wet areas	4 Secure	S4	-
<i>Cornus alternifolia</i>	Alternate Leaf Dogwood	2017, 2018	Upland forest, Riparian areas	4 Secure	S5	-
<i>Cornus canadensis</i>	Bunchberry	2017, 2018	Upland, shaded	4 Secure	S5	-
<i>Cornus sericea</i>	Red Osier Dogwood	2017, 2018	Generalist, Wetland edge	4 Secure	S5	-
<i>Corylus cornuta</i>	Beaked Hazelnut	2017, 2018	Upland forest	4 Secure	S5	-
<i>Crataegus spp.</i>	Hawthorn	2017, 2018	Upland forest, Abandoned pasture	4 Secure	S5	-
<i>Cypripedium acaule</i>	Pink Lady's Slipper	2017, 2018	Acidic soil, wet and dry areas	4 Secure	S5	-
<i>Danthonia spicata</i>	Poverty Oat Grass	2017	Generalist	4 Secure	S5	-
<i>Daucus carota</i>	Queen Anne's Lace	2017, 2018	Dry fields and around waste areas	7 Exotic	SNA	-
<i>Dennstaedtia punctilobula</i>	Eastern Hay Scented Fern	2017, 2018	Disturbed areas, upland forest, fields, meadows	4 Secure	S5	-
<i>Dianthus armeria</i>	Deptford Pink	2017, 2018	Disturbed areas, Roadside, Upland	7 Exotic	SNA	-
<i>Diervilla lonicera</i>	Bush Honeysuckle	2017, 2018	Forest edge, Abandoned fields, roadside, Open wetlands	4 Secure	S5	-
<i>Doellingeria umbellata</i>	Flat Topped Aster	2017, 2018	Wet areas, forest	4 Secure	S5	-
<i>Drosera rotundifolia</i>	Roundleaf Sundew	2017	Wet areas	4 Secure	S5	-
<i>Dryopteris campyloptera</i>	Mountain Wood Fern	2017, 2018	Upland forest, High elevations	4 Secure	S5	-
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	2017, 2018	Upland forest, Shoreline	4 Secure	S5	-
<i>Dryopteris cristata</i>	Crested Wood Fern	2017, 2018	Wet areas	4 Secure	S5	-
<i>Elymus virginicus</i>	Wild Rye Grass	2017, 2018	Generalist, Wetland fringe	4 Secure	S5	-
<i>Epigaea repens</i>	Trailing Arbutus	2017	Sandy to peaty woods or clearings	4 Secure	S5	-
<i>Epilobium leptophyllum</i>	Bog Willowherb	2017	Wetland	4 Secure	S5	-
<i>Epipactis helleborine</i>	Helleborine	2017, 2018	Open forest, upland areas,	7 Exotic	SNA	-
<i>Epilobium leptophyllum</i>	Bog Willowherb	2017, 2018	Wet areas	4 Secure	S5	-
<i>Equisetum fluviatile</i>	Water Horsetail	2018	Wet areas	4 Secure	S5	-
<i>Equisetum sylvaticum</i>	Wood Horsetail	2017, 2018	Moist areas, Open woods	4 Secure	S5	-
<i>Eupatorium perfoliatum</i>	Common Boneset	2017, 2018	Wet areas	4 Secure	S5	-
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	2017, 2018	Wet areas, Old field, Roadside	4 Secure	S5	-
<i>Eupatorium maculatum</i>	Joe Pye Weed	2017, 2018	Wet areas	4 Secure	S5	-
<i>Eriophorum virginicum</i>	Tawny Cottonsedge	2017, 2018	Wet areas	4 Secure	S5	-

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSEA
<i>Fagus grandifolia</i>	American Beech	2017, 2018	Upland forest, Fringe areas	4 Secure	S5	-
<i>Frangula alnus</i>	Glossy Buckthorn	2017, 2018	Upland forest, open field, disturbed areas	7 Exotic	SNA	-
<i>Fraxinus americana</i>	White Ash	2017, 2018	Wet areas, Moist forest	4 Secure	S5	-
<i>Fraxinus nigra</i>	Black Ash	2017	Wet areas, Moist forest	1 At Risk	S1S2	Threatened
<i>Galium mollugo</i>	Smooth Bedstraw	2017, 2018	Roadside, Disturbed areas	7 Exotic	SNA	-
<i>Gallium palustre</i>	Common Marsh Bedstraw	2017	Wet areas, Meadows	4 Secure	S5	-
<i>Galium triflorum</i>	Three-flowered Bedstraw	2017	Moist woods, Thickets	4 Secure	S5	-
<i>Gaultheria procumbens</i>	Eastern Teaberry	2017, 2018	Shaded forest	4 Secure	S5	-
<i>Gaylussacia baccata</i>	Black Huckleberry	2017, 2018	Forest, field, Meadow	4 Secure	S5	-
<i>Geum canadense</i>	White Avens	2017, 2018	Upland forest, Meadow, Prairie	4 Secure	S4S5	-
<i>Geum rivale</i>	Water Avens	2018	Wet areas	4 Secure	S5	-
<i>Geranium pratense</i>	Meadow Crane's-bill	2017	Field, Meadow, Riparian areas	7 Exotic	SNA	-
<i>Glyceria canadensis</i>	Rattlesnake Mannagrass	2017, 2018	Wet areas	4 Secure	S5	-
<i>Gymnocarpium dryopteris</i>	Northern Oak Fern	2017, 2018	Rock ledges, Rock slopes	4 Secure	S5	-
<i>Hamamelis virginiana</i>	American Witch-Hazel	2017	Woodlands, Forest margins and Stream banks	4 Secure	S5	-
<i>Hieracium lachenalii</i>	Common Hawkweed	2017, 2018	Disturbed areas, Meadows, Fields	7 Exotic	SNA	-
<i>Honckenya peploides</i>	Seabeach Sandwort	2018	Coastal, Beach	4 Secure	S5	-
<i>Hordeum jubatum</i>	Fox Tail Barley	2017, 2018	Disturbed areas, Salty soil	4 Secure	S5	-
<i>Hydrocotyle americana</i>	American Marsh Pennywort	2017, 2018	Wetland edge, Disturbed areas, Shoreline	4 Secure	S5	-
<i>Ilex verticillata</i>	Winterberry	2017, 2018	Wet areas, Riverbanks, Forest edge	4 Secure	S5	-
<i>Impatiens capensis</i>	Spotted Jewelweed	2017, 2018	Wet areas	4 Secure	S5	-
<i>Iris versicolor</i>	Blue Flag Iris	2017, 2018	Wet areas	4 Secure	S5	-
<i>Juncus effuses</i>	Soft Rush	2017, 2018	Wet areas	4 Secure	S5	-
<i>Juncus bufonius</i>	Toad Rush	2017, 2018	Wet areas	4 Secure	S5	-
<i>Juncus filiformis</i>	Thread Rush	2018		4 Secure	S5	
<i>Kalmia angustifolia</i>	Sheep Laurel	2017, 2018	Disturbed areas, Wet areas, Shoreline	4 Secure	S5	-
<i>Larix laricina</i>	Tamarack	2017, 2018	Wet areas	4 Secure	S5	-
<i>Luzula multiflora</i>	Common Woodrush	2018	Generalist	4 Secure	S5	

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSESA
<i>Leersia oryzoides</i>	Rice Cutgrass	2017, 2018	Wet areas	4 Secure	S5	-
<i>Ledum groenlandicum</i>	Labrador Tea	2017, 2018	Wet areas, Shaded, Rocky areas	4 Secure	S5	-
<i>Lemna turionifera</i>	Turion Duckweed	2017	Wet areas	4 Secure	S5	-
<i>Leymus mollis</i>	Sea Lyme Grass	2017, 2018	Coastal habitats	4 Secure	S5	-
<i>Linnaea borealis</i>	Twinflower	2017, 2018	Upland forest	4 Secure	S5	-
<i>Lolium perenne</i>	Winter Ryegrass	2017, 2018	Disturbed areas, open habitat	7 Exotic	SNA	-
<i>Lonicera canadensis</i>	Canada Fly Honeysuckle	2017, 2018	Wet areas, Moist forest	4 Secure	S5	-
<i>Luzula multiflora</i>	Woodland Rush	2017, 2018	Upland forest	4 Secure	S5	-
<i>Lycopus uniflorus</i>	Northern Water Horehound	2017, 2018	Wet areas	4 Secure	S5	-
<i>Lysimachia terrestris</i>	Swamp Candles	2017, 2018	Wet areas	4 Secure	S5	-
<i>Lythrum salicaria</i>	Purple Loosestrife	2017, 2018	Roadside, Disturbed areas	7 Exotic	SNA	-
<i>Maianthemum canadense</i>	Wild lily of the Valley	2017, 2018	Generalist	4 Secure	S5	-
<i>Maianthemum trifolium</i>	Three-Leaved Solomon's Seal	2017, 2018	Wetland	4 Secure	S5	-
<i>Malaxis unifolia</i>	Green Adder's-Mouth	2017	Swamps, Bogs	4 Secure	S4S5	-
<i>Malus pumila</i>	Common Apple	2017, 2018	Old field	7 Exotic	SNA	-
<i>Medeola virginiana</i>	Indian Cucumber Root	2017, 2018	Moist forest, Wetland edge	4 Secure	S5	-
<i>Mentha arvensis</i>	Wild Mint	2017, 2018	Wet areas, Shoreline	4 Secure	S5	-
<i>Mimulus ringens</i>	Square-stemmed Monkeyflower	2017	Wet areas	4 Secure	S4S5	-
<i>Mitchella repens</i>	Partridgeberry	2017, 2018	Forests	4 Secure	S5	-
<i>Mitella nuda</i>	Naked Bishop's Cap	2017, 2018	Wet areas, Shoreline	4 Secure	S4S5	-
<i>Moneses uniflora</i>	One-flowered Wintergreen	2018	Wet areas	4 Secure	S4S5	-
<i>Monotropa uniflora</i>	Indian Pipe	2017, 2018	Upland forest	4 Secure	S5	-
<i>Morella pensylvanica</i>	Northern Bayberry	2017, 2018	Coastal	4 Secure	S5	-
<i>Nemopanthus mucronatus</i>	Mountain Holly	2017, 2018	Open areas, Hillslope	4 Secure	S5	-
<i>Oclemena acuminata</i>	Whorled Aster	2017, 2018	Upland forest	4 Secure	S5	-
<i>Oenothera biennis</i>	Common Evening Primrose	2017, 2018	Disturbed areas, Upland forest	4 Secure	S5	-
<i>Onoclea sensibilis</i>	Sensitive Fern	2017, 2018	Wet areas	4 Secure	S5	-
<i>Osmanthus heterophyllus</i>	False Holly	2017, 2018	Moist forest	4 Secure	S5	-
<i>Osmunda cinnamomea</i>	Cinnamon Fern	2017, 2018	Wet areas, Moist forest	4 Secure	S5	-
<i>Osmunda claytoniana</i>	Interrupted Fern	2017, 2018	Wet areas, Upland forest, Shoreline	4 Secure	S5	-
<i>Osmunda regalis</i>	Royal Fern	2017, 2018	Floodplain, Shoreline, Wet areas	4 Secure	S5	-
<i>Oxalis montana</i>	Common Wood Sorrel	2017, 2018	Shaded forest, Wet areas	4 Secure	S5	-

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSESA
<i>Packera schweinitziana</i>	Schweinitz's Groundsel	2018	Wet areas	4 Secure	S4	-
<i>Petasites frigidus</i>	Northern Sweet Coltsfoot	2018	Wet areas	4 Secure	S4	-
<i>Phalaris arundinacea</i>	Reed Canary Grass	2017, 2018	Wet areas, Open forest	4 Secure	S5	-
<i>Phegopteris connectilis</i>	Northern Beech Fern	2017, 2018	Upland forest	4 Secure	S5	-
<i>Phleum pratense</i>	Common Timothy	2017, 2018	Disturbed areas, field	7 Exotic	SNA	-
<i>Picea glauca</i>	White Spruce	2017, 2018	Upland forest	4 Secure	S5	-
<i>Picea mariana</i>	Black Spruce	2017, 2018	Moist forest	4 Secure	S5	-
<i>Picea rubens</i>	Red Spruce	2017, 2018	Generalist	4 Secure	S5	-
<i>Pinus resinosa</i>	Red Pine	2017, 2018	Upland forest, Open areas	4 Secure	S4S5	-
<i>Pinus strobus</i>	White Pine	2017, 2018	Well-drained areas	4 Secure	S5	-
<i>Platanthera clavellata</i>	Club Spur Orchid	2017	Wetland areas	4 Secure	S5	-
<i>Platanthera psycodes</i>	Small Purple Fringed Orchid	2017, 2018	Wet areas, Disturbed areas	4 Secure	S4	-
<i>Poa pratensis</i>	Kentucky Blue Grass	2017	Field, Meadow	4 Secure	S5	-
<i>Polygonum hydropiper</i>	Marsh Pepper Smartweed	2017, 2018	Wet areas, Disturbed sites	7 Exotic	SNA	-
<i>Polygonum sagittatum</i>	Arrow-Leaved Terrathumb	2017, 2018	Wet areas, Roadside	4 Secure	S5	-
<i>Polystichum acrostichoides</i>	Christmas Fern	2017, 2018	Wet areas, Upland forest	4 Secure	S5	-
<i>Populus grandidentata</i>	Large toothed Aspen	2017, 2018	Upland forest, Disturbed sites	4 Secure	S5	-
<i>Populus tremuloides</i>	Trembling Aspen	2017, 2018	Upland forest, Disturbed sites	4 Secure	S5	-
<i>Potamogeton foliosus</i>	Leafy Pondweed	2017	Ponds	4 Secure	S4S5	-
<i>Prenanthes altissima</i>	Tall Rattlesnakeroot	2018	Forest areas	4 Secure	S5	-
<i>Prunella vulgaris</i>	Common Self-heal	2017, 2018	Wet areas, field, open areas	4 Secure	S5	-
<i>Prunus pensylvanica</i>	Pin Cherry	2017, 2018	Disturbed sites, Forest edge, Clear-cut	4 Secure	S5	-
<i>Prunus virginiana</i>	Choke Cherry	2017, 2018	Clearings, Hillside, Open areas	4 Secure	S5	-
<i>Pteridium aquilinum</i>	Bracken Fern	2017, 2018	Upland habitat	4 Secure	S5	-
<i>Pyrola elliptica</i>	Shinleaf	2017, 2018	Forested areas	4 Secure	S5	-
<i>Pyrola americana</i>	Roundleaf Pyrola	2017, 2018	Wet areas, Moist forest	4 Secure	S5	-
<i>Quercus rubra</i>	Red Oak	2017, 2018	Upland areas, Hillside	4 Secure	S5	-
<i>Ranunculus acris</i>	Common Buttercup	2017	Wet areas, Meadows	7 Exotic	SNA	-

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSESA
<i>Ranunculus repens</i>	Creeping Buttercup	2017, 2018	Wet areas, Roadside, Field	7 Exotic	SNA	-
<i>Rhododendron canadense</i>	Rhodora	2017, 2018	Wet areas	4 Secure	S5	-
<i>Rhynchospora alba</i>	White Beakrush	2017, 2018	Wet areas	4 Secure	S5	-
<i>Rhynchospora fusca</i>	Brown Beakrush	2017	Wet areas	4 Secure	S4	-
<i>Ribes glandulosum</i>	Skunk Currant	2017	Moist woods, Thickets	4 Secure	S5	-
<i>Rorippa nasturtium-aquaticum</i>	Watercress	2017, 2018	Wet areas	7 Exotic	SNA	-
<i>Rosa virginiana</i>	Virginia Rose	2017, 2018	Upland areas	4 Secure	S5	-
<i>Rubus hispidus</i>	Swamp Dewberry	2017, 2018	Wet areas	4 Secure	S5	-
<i>Rubus idaeus</i>	Red Raspberry	2017, 2018	Clearings, Forest edge, Roadside, Riverbanks	4 Secure	S5	-
<i>Rubus setosus</i>	Bristly Blackberry	2017, 2018	Wet areas	4 Secure	S4	-
<i>Rumex orbiculatus</i>	Greater Water Dock	2018	Wet areas	4 Secure	S5	-
<i>Salix bebbiana</i>	Bebb's Willow	2017, 2018	Moist forests	4 Secure	S5	-
<i>Salix discolor</i>	Pussy Willow	2017		4 Secure	S5	-
<i>Salix lucida</i>	Shining Willow	2017, 2018	Disturbed areas, Shoreline, Wet areas	4 Secure	S5	-
<i>Schoenoplectus tabernaemontani</i>	Softstem Bulrush	2017	Wet areas, Marshes	4 Secure	S5	-
<i>Scirpus atrocinctus</i>	Black-girdled Bulrush	2017, 2018	Wet areas, Shoreline	4 Secure	S5	-
<i>Scirpus hattorianus</i>	Mosquito Bulrush	2017, 2018	Disturbed areas, Wet areas	4 Secure	S5	-
<i>Scutellaria galericulata</i>	Marsh Skullcap	2017, 2018	Wet areas	4 Secure	S5	-
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	2017	Wet areas	4 Secure	S5	-
<i>Solidago canadensis</i>	Canada Goldenrod	2017, 2018	Meadow, Roadside, Field	4 Secure	S4S5	-
<i>Solidago nemoralis</i>	Field Goldenrod	2017, 2018	Field, Open areas	4 Secure	S4S5	-

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSESA
<i>Solidago sempervirens</i>	Seaside Goldenrod	2017, 2018	Coastal	4 Secure	S5	-
<i>Solidago rugosa</i>	Rough Stemmed Goldenrod	2017, 2018	Wet areas, Moist forest	4 Secure	S5	-
<i>Sorbus americana</i>	Mountain Ash	2017, 2018	Moist forest, Wetland edge	4 Secure	S5	-
<i>Sparganium americanum</i>	American Burreed	2017	Wetland	4 Secure	S5	-
<i>Sparganium emersum</i>	Green-fruited Burreed	2017, 2018	Wetland	4 Secure	S5	-
<i>Sparganium eurycarpum</i>	Broad-fruited Burreed	2017	Wetland	4 Secure	S4	-
<i>Spartina patens</i>	Saltmeadow Cordgrass	2017, 2018	Coastal	4 Secure	S5	-
<i>Spiraea alba</i>	White Meadowsweet	2017, 2018	Disturbed sites, Wet areas, Shoreline	4 Secure	S5	-
<i>Spiraea tomentosa</i>	Steeplebush	2017, 2018	Wet areas, Moist forest	4 Secure	S5	-
<i>Spiranthes lacera</i>	Slender Ladies'-tresses	2017	Open areas; Disturbed areas	4 Secure	S5	-
<i>Spiranthes romanzoffiana</i>	Hooded Ladies Tresses	2017	Wet areas	4 Secure	S4	-
<i>Suaeda maritima</i>	White Sea-blite	2018	Coastal	4 Secure	S5	-
<i>Streptopus lanceolatus</i> var. <i>lanceolatus</i>	Lance-leaf Twisted Stalk	2017, 2018	Upland forest	4 Secure	S5	-
<i>Symphyotrichum lanceolatum</i>	Tall White Aster	2017, 2018	Disturbed sites, Forest edge	4 Secure	S4S5	-
<i>Syphyotrichum puniceum</i>	Purple Stemmed Aster	2017	Wet areas, Open field, Shoreline	4 Secure	S5	-
<i>Taxus canadensis</i>	Canada Yew	2017, 2018	Moist forest, Shaded areas, Wet areas	4 Secure	S4S5	-
<i>Thalictrum pubescens</i>	Tall Meadow Rue	2017, 2018	Wet areas, Moist forest	4 Secure	S5	-
<i>Thelypteris noveboracensis</i>	New York Fern	2017, 2018	Moist woodland, Riparian areas	4 Secure	S5	-
<i>Thelypteris palustris</i>	Eastern Marsh Fern	2017, 2018	Wet areas	4 Secure	S5	-
<i>Tiarella cordifolia</i>	Heart-Leaved Foam Flower	2018	Shaded, Moist forest	3 Sensitive	S2	-
<i>Toxicodendron radicans</i>	Poison Ivy	2017, 2018	Generalist	4 Secure	S4	-

PLANT	COMMON NAME	YEAR(S) IDENTIFIED	PREFERRED HABITAT	PROV. GS RANK	S-RANK	COSEWIC SARA/NSESA
<i>Triadenum fraseri</i>	Marsh St. John's Wart	2017, 2018	Wet areas	4 Secure	S5	-
<i>Trientalis borealis</i>	Starflower	2017, 2018	Generalist, Shaded, Moist forest	4 Secure	S5	-
<i>Trillium undulatum</i>	Painted Trillium	2017, 2018	Moist forest, Acidic soils	4 Secure	S5	-
<i>Tsuga canadensis</i>	Eastern White Hemlock	2017, 2018	Hillslope, Shoreline, Riparian areas	4 Secure	S4S5	-
<i>Tussilago farfara</i>	Colts Foot	2017, 2018	Disturbed areas, Field	7 Exotic	SNA	-
<i>Typha angustifolia</i>	Narrow Leaved Cattail	2017, 2018	Wet areas	4 Secure	S5	-
<i>Typha latifolia</i>	Broadleaf Cattail	2017, 2018	Wet areas	4 Secure	S5	-
<i>Vaccinium angustifolium</i>	Lowbush Blueberry	2017, 2018	Field, Meadow, Upland forest	4 Secure	S5	-
<i>Vaccinium myrtilloides</i>	Velvet Leaf Blueberry	2017	Field, Open areas, Wet areas	4 Secure	S5	-
<i>Veronica americana</i>	American Speedwell	2017, 2018	Riparian areas, Wet areas	4 Secure	S5	-
<i>Viburnum nudum</i>	Wild Raisin	2017, 2018	Upland forest, Wet areas	4 Secure	S5	-
<i>Vicia cracca</i>	Cow Vetch	2017, 2018	Open fields, Along roadside	7 Exotic	SNA	-
<i>Viola cucullata</i>	Marsh Blue Violet	2018	Wet areas	4 Secure	S5	-
<i>Viola macloskeyi</i>	Small White Violet	2018	Wet areas	4 Secure	S5	-

# APPENDIX

## C WILDLIFE SURVEY PHOTOLOG



Photo 1: Snake point 1 Northern view, May 14, 2018



Photo 2: Snake point 1 Eastern view, May 14, 2018



Photo 3: Snake point 1 Southern view, May 14 2018



Photo 4: Snake point 1 Western view, May 14, 2018



Photo 5: Snake point 2 Northern view, May 14, 2018



Photo 6: Snake point 2 Eastern view, May 14, 2018



Photo 7: Snake point 2 Southern view, May 14, 2018



Photo 8: Snake point 2 Western view, May 14, 2018



Photo 9: Snake point 3 Northern view, May 14, 2018



Photo 10: Snake point 3 Eastern view, May 14, 2018



Photo 11: Snake point 3 Southern view, May 14, 2018



Photo 12: Snake point 3 Western view, May 14, 2018



Photo 13: Snake point 4 Northern view, May 14, 2018



Photo 14: Snake point 4 Eastern view, May 14, 2018



Photo 15: Snake point 4 Southern view, May 14, 2018



Photo 16: Snake point 4 Western view, May 14, 2018



Photo 17: Snake point 5 Northern view, May 14, 2018



Photo 18: Snake point 5 Eastern view, May 14, 2018



Photo 19: Snake point 5 Southern view, May 14, 2018



Photo 20: Snake point 5 Western view, May 14, 2018



Photo 21: Snake point 6, Northern View, May 28, 2018



Photo 22: Snake point 6 Eastern view, May 28, 2018



Photo 23: Snake point 6 Southern view, May 28, 2018



Photo 24: Snake point 6 Western view, May 28, 2018



Photo 25: Snake point 7 Northern view, May 14, 2018



Photo 26: Snake point 7 Eastern view, May 14, 2018



Photo 27: Snake point 7 Southern view, May 14, 2018



Photo 28: Snake point 7 Western view, May 14, 2018



Photo 29: Turtle survey area 1, August 30, 2017



Photo 30: Turtle survey area 1, August 30, 2017



Photo 31: Turtle survey area 1, August 30, 2017



Photo 32: Turtle survey area 1, August 30, 2017



Photo 33: Turtle survey area 2, August 30, 2017



Photo 34: Turtle survey area 2, August 30, 2017



Photo 35: Turtle survey area 2, August 30, 2017



Photo 36: Turtle survey area 2, August 30, 2017



Photo 37: Turtle Survey point 3, August 30, 2017

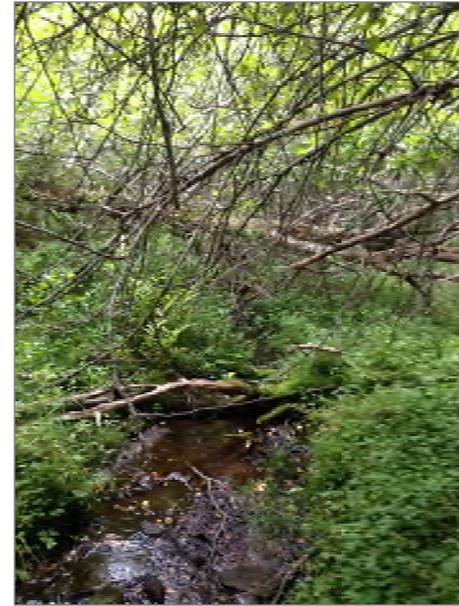


Photo 38: Turtle survey point 3, August 30, 2017

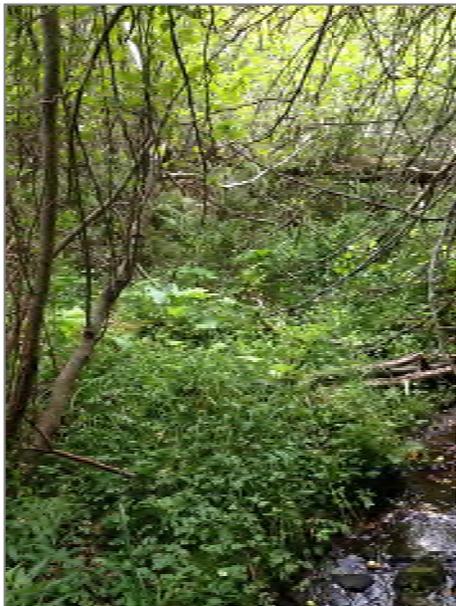


Photo 39: Turtle survey point 3, August 30, 2017

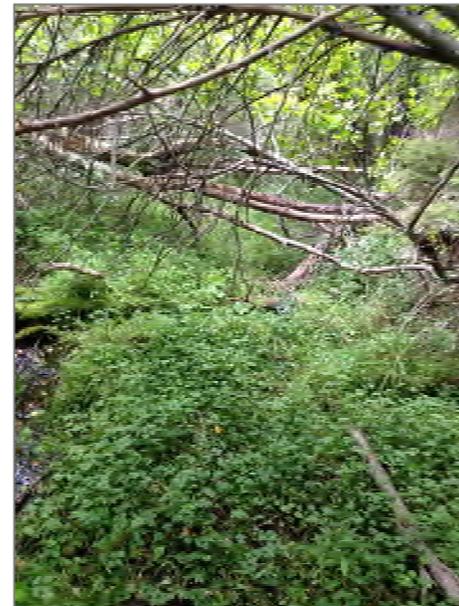


Photo 40: Turtle survey point 3, August 30, 2017



Photo 41: Turtle survey point 4, September 12, 2017



Photo 42: Turtle survey point 4, September 12, 2017



Photo 43: Turtle survey point 4, September 12, 2017



Photo 44: Turtle survey point 4, September 12, 2017



Photo 45: Turtle Survey point 5, September 7, 2017



Photo 46: Turtle survey point 5, May 14, 2018



Photo 47: Turtle survey point 5, May 14, 2018



Photo 48: Turtle survey point 5, September 27, 2017



Photo 49: Turtle survey point 6, August 31, 2017



Photo 50: Turtle survey point 6, August 31, 2017



Photo 51: Turtle survey point 6, August 31, 2017



Photo 52: Turtle survey point 6, August 31, 2017



Photo 53: Turtle survey point 7, September 6, 2017



Photo 54: Turtle survey point 7, September 6, 2017



Photo 55: Turtle survey point 7, September 6, 2017



Photo 56: Turtle survey point 7, September 6, 2017



Photo 57: Turtle survey point 8, September 6, 2017



Photo 58: Turtle survey point 8, September 6, 2017



Photo 59: Turtle survey point 8, September 6, 2017



Photo 60: Turtle survey point 8, September 6, 2017



Photo 61: Turtle survey point 9, August 31, 2017



Photo 62: Turtle survey point 9, August 31, 2017



Photo 63: Turtle survey point 9, August 31, 2017

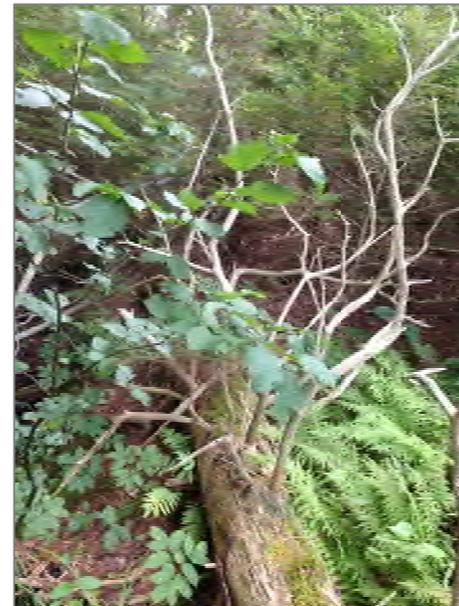


Photo 64: Turtle survey point 9, August 31, 2017



Photo 65: Deer Faun at the fringe of WL-13b, May 28, 2018



Photo 66: Porcupine near WC-16, October 25, 2017



Photo 67: Porcupine near WC-16, October 25, 2017



Photo 68: Garter Snake found at Snake point 2 May 14, 2018



Photo 69: Snakepoint 2 Garter snake continued, May 14, 2018



Photo 70: Beaver Activity wetland 10, August 24, 2017



Photo 71: Deer remains found at wetland 14 September 8, 2018



Photo 72: Wildlife den found in upland habitat, September 25, 2017



Photo 73: Duck egg found at WL-23a, June 4, 2018



Photo 74: Maritime garter snake at WL-2B, June 6, 2018



Photo 75: Porcupine found near WL-7, June 6-2018



Photo 76: Red-backed Salamander at WL-20c, June 6, 2018.



Photo 77: Bird's nest with Eggs, June 27, 2018.



Photo 78: Ring-necked snake found at snake point 1, June 27, 2018



Photo 79: Garter snake found at snake point 1, June 27, 2018.



Photo 80: Ring necked snake continued, June 27, 2018.

# APPENDIX

## D LIMITATIONS



## LIMITATIONS

### **Limited use**

*This Report was prepared for GHD, solely for their exclusive use to provide an Assessment of current environmental conditions in association with the Site. WSP will not be responsible for any use of this report by any other party, for any decisions to be made based on it, or for the consequences thereof, unless written reliance is granted by WSP. Unless otherwise agreed in writing by WSP, it shall not be used to express or imply warranty as to the suitability of the property for a particular purpose. WSP disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.*

### **Excerpts**

*The Report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.*

### **Information from others**

*In evaluating the Site, WSP has relied in good faith on information provided by others, as noted in the Report. WSP has assumed that the information provided is correct and WSP assumes no responsibility for the accuracy, completeness or workmanship of any such information.*

### **Standard of care**

*This project has been carried out using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners, working under similar conditions and subject to the time, financial and physical constraints applicable to this project. The conclusions presented in this Report are based on Work undertaken by trained professional and technical staff and the reasonable and professional interpretation using accepted engineering and scientific practices current at the time the work was performed. Conclusions presented in this report should not be construed as legal advice. WSP makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in the Report, including, but not limited to, ownership of any property, or the application of any law to the findings of the Assessment.*

### **Limited scope**

*The Report summarizes WSP's review of available data in accordance with the principal components of the stated regulations, standards and guidelines and the scope, terms and conditions of the contract or proposal to which the Assignment was conducted. No other warranties are either expressed or implied with respect to the professional services provided under the terms of the contract or proposal and represented in this Report. Conditions may exist which were not detected given the nature of the inquiry WSP was retained to undertake with respect to the Site. Additional environmental studies and actions may be recommended.*

### **Changes over time**

*The Report is based on data and information collected at the time of this Assessment, as stated in the Report. Site use or conditions change and the information and conclusions in the Report may no longer apply following the date of this Report. If any conditions become apparent that differ significantly from that presented in this Report, we request that we be notified to reassess the conclusions and recommendations provided herein. WSP disclaims any obligation to update this Report for conditions that may be identified after the date of this Report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.*

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**Data Report 5887: Boat Harbour, NS (Atlantic  
Canada Conservation Data Centre 2017)**

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# DATA REPORT 5887: Boat Harbour, NS

Prepared 12 July 2017  
by J. Churchill, Data Manager

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### 1.0 Preface

- 1.1 Data List
- 1.2 Restrictions
- 1.3 Additional Information
- Map 1: Buffered Study Area

### 2.0 Rare and Endangered Species

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- 2.2 Fauna
- Map 2: Flora and Fauna

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- Map 3: Special Areas

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### 5.0 Rare Species within 100 km

- 5.1 Source Bibliography



Map 1. A 100 km buffer around the study area

## 1.0 PREFACE

The Atlantic Canada Conservation Data Centre (ACCDC) is part of a network of NatureServe data centres and heritage programs serving 50 states in the U.S.A, 10 provinces and 1 territory in Canada, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The ACCDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. Although a non-governmental agency, the ACCDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees. URL: [www.ACCDC.com](http://www.ACCDC.com).

Upon request and for a fee, the ACCDC queries its database and produces customized reports of the rare and endangered flora and fauna known to occur in or near a specified study area. As a supplement to that data, the ACCDC includes locations of managed areas with some level of protection, and known sites of ecological interest or sensitivity.

### 1.1 DATA LIST

Included datasets:

Filename	Contents
BoatHrNS_5887ob.xls	All Rare and legally protected <i>Flora and Fauna</i> in your study area
BoatHrNS_5887ob100km.xls	A list of Rare and legally protected <i>Flora and Fauna</i> within 100 km of your study area
BoatHrNS_5887ma.xls	All <i>Managed Areas</i> in your study area
BoatHrNS_5887sa.xls	All <i>Significant Natural Areas</i> in your study area
BoatHrNS_5887bc.xls	Rare and common <i>Colonial Birds</i> in your study area

## 1.2 RESTRICTIONS

The ACCDC makes a strong effort to verify the accuracy of all the data that it manages, but it shall not be held responsible for any inaccuracies in data that it provides. By accepting ACCDC data, recipients assent to the following limits of use:

- a) Data is restricted to use by trained personnel who are sensitive to landowner interests and to potential threats to rare and/or endangered flora and fauna posed by the information provided.
- b) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
- c) The ACCDC requires Data Users to cease using and delete data 12 months after receipt, and to make a new request for updated data if necessary at that time.
- d) ACCDC data responses are restricted to the data in our Data System at the time of the data request.
- e) Each record has an estimate of locational uncertainty, which must be referenced in order to understand the record's relevance to a particular location. Please see attached Data Dictionary for details.
- f) ACCDC data responses are not to be construed as exhaustive inventories of taxa in an area.
- g) The absence of a taxon cannot be inferred by its absence in an ACCDC data response.

## 1.3 ADDITIONAL INFORMATION

The attached file DataDictionary 2.1.pdf provides metadata for the data provided.

Please direct any additional questions about ACCDC data to the following individuals:

### Plants, Lichens, Ranking Methods, All other Inquiries

Sean Blaney, Senior Scientist, Executive Director

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Questions on the biology of Federal Species at Risk can be directed to ACCDC: (506) 364-2658, with questions on Species at Risk regulations to: Samara Eaton, Canadian Wildlife Service (NB and PE): (506) 364-5060 or Julie McKnight, Canadian Wildlife Service (NS): (902) 426-4196.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Stewart Lusk, Natural Resources: (506) 453-7110.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Sherman Boates, NSDNR: (902) 679-6146. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NSDNR Regional Biologist:

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For provincial information about rare taxa and protected areas, or information about game animals, fish habitat etc., in Prince Edward Island, please contact Garry Gregory, PEI Dept. of Communities, Land and Environment: (902) 569-7595.

## 2.0 RARE AND ENDANGERED SPECIES

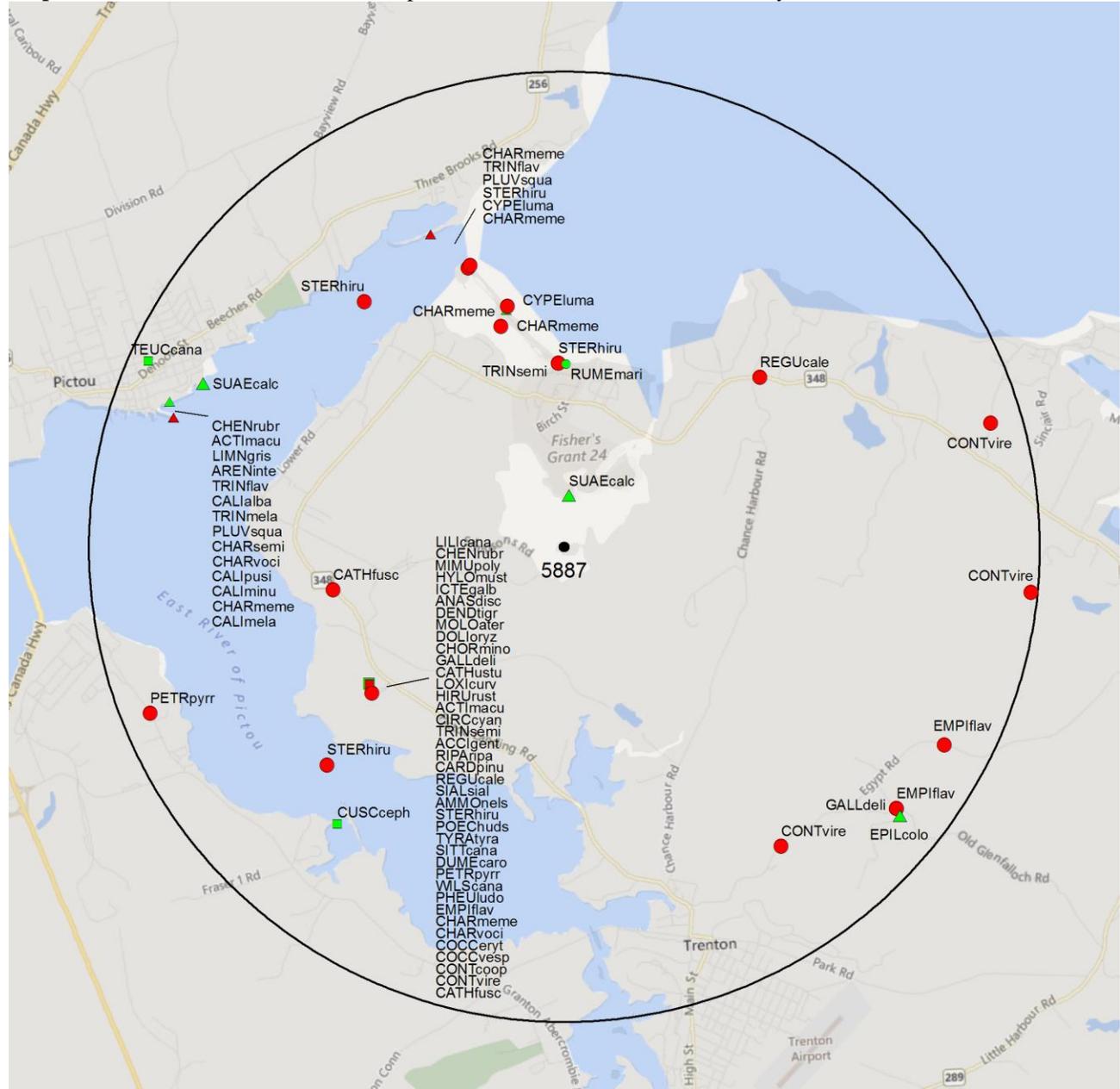
### 2.1 FLORA

The study area contains 11 records of 8 vascular, no records of nonvascular flora (Map 2 and attached: \*ob.xls).

### 2.2 FAUNA

The study area contains 144 records of 47 vertebrate, no records of invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

**Map 2:** Known observations of rare and/or protected flora and fauna within the study area.



- RESOLUTION**
- 4.7 within 50s of kilometers
  - 4.0 within 10s of kilometers
  - 3.7 within 5s of kilometers
  - △ 3.0 within kilometers
  - △ 2.7 within 500s of meters
  - ◇ 2.0 within 100s of meters
  - ◇ 1.7 within 10s of meters

- HIGHER TAXON**
- vertebrate fauna
  - invertebrate fauna
  - vascular flora
  - nonvascular flora

### 3.0 SPECIAL AREAS

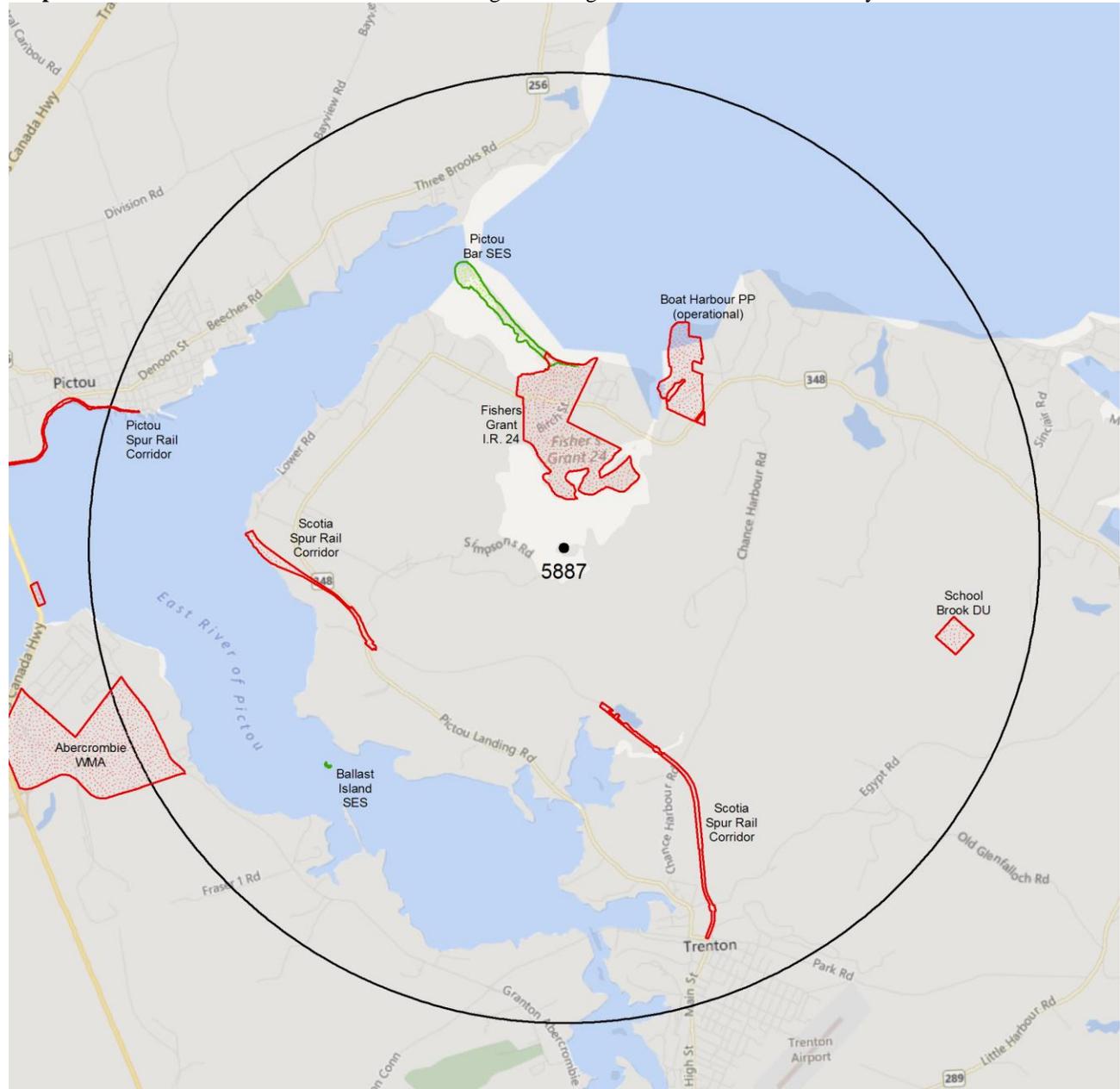
#### 3.1 MANAGED AREAS

The GIS scan identified 6 managed areas in the vicinity of the study area (Map 3 and attached file: \*ma\*.xls)

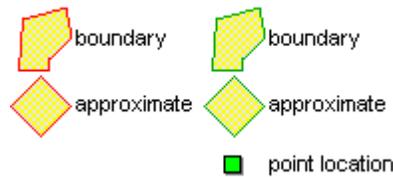
#### 3.2 SIGNIFICANT AREAS

The GIS scan identified 2 biologically significant sites in the vicinity of the study area (Map 3 and attached file: \*sa\*.xls)

**Map 3:** Boundaries and/or locations of known Managed and Significant Areas within the study area.



**MANAGED AREAS    SIGNIFICANT AREAS**



## 4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding “location-sensitive” species, section 4.3) within the study area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation ( $\pm$  the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files \*ob.xls/\*ob.shp only.

### 4.1 FLORA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
P	<i>Cyperus lupulinus ssp. macilentus</i>	Hop Flatsedge				S1	2 May Be At Risk	2	2.6 $\pm$ 0.0
P	<i>Chenopodium rubrum</i>	Red Pigweed				S2	2 May Be At Risk	2	2.5 $\pm$ 7.0
P	<i>Lilium canadense</i>	Canada Lily				S2	2 May Be At Risk	1	2.5 $\pm$ 7.0
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	5 Undetermined	1	3.8 $\pm$ 1.0
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2?	3 Sensitive	1	4.5 $\pm$ 1.0
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	1	4.8 $\pm$ 5.0
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	2	0.5 $\pm$ 2.0
P	<i>Rumex maritimus</i>	Sea-Side Dock				S3S4		1	1.9 $\pm$ 0.0

### 4.2 FAUNA

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	32	2.4 $\pm$ 0.0
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S2B	1 At Risk	1	2.5 $\pm$ 7.0
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S2B	1 At Risk	1	2.5 $\pm$ 7.0
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Endangered	S2S3B	1 At Risk	2	2.5 $\pm$ 7.0
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	1	2.5 $\pm$ 7.0
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3B	1 At Risk	2	2.5 $\pm$ 7.0
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	1	2.5 $\pm$ 7.0
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened			SUB	5 Undetermined	1	2.5 $\pm$ 7.0
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	6	2.5 $\pm$ 7.0
A	<i>Coccothraustes vespertinus</i>	Evening Grosbeak	Special Concern			S3S4B,S3N	4 Secure	1	2.5 $\pm$ 7.0
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	16	1.9 $\pm$ 0.0
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	1	2.5 $\pm$ 7.0
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	4 Secure	1	2.5 $\pm$ 7.0
A	<i>Circus cyaneus</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	1	2.5 $\pm$ 7.0
A	<i>Ammodramus nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	1	2.5 $\pm$ 7.0
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	4 Secure	1	2.5 $\pm$ 7.0
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S3M	4 Secure	3	4.3 $\pm$ 0.0
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	4 Secure	3	4.3 $\pm$ 0.0
A	<i>Dendroica tigrina</i>	Cape May Warbler				S2B	3 Sensitive	1	2.5 $\pm$ 7.0
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	4 Secure	1	2.5 $\pm$ 7.0
A	<i>Carduelis pinus</i>	Pine Siskin				S2S3	3 Sensitive	1	2.5 $\pm$ 7.0
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	4	1.9 $\pm$ 0.0
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	2 May Be At Risk	3	2.5 $\pm$ 7.0
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	3	2.5 $\pm$ 0.0
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B	2 May Be At Risk	2	2.5 $\pm$ 7.0
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S2S3M	4 Secure	1	4.3 $\pm$ 0.0
A	<i>Poecile hudsonica</i>	Boreal Chickadee				S3	3 Sensitive	1	2.5 $\pm$ 7.0
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	2	2.5 $\pm$ 7.0
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	4	2.5 $\pm$ 7.0
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B	3 Sensitive	2	2.5 $\pm$ 7.0
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	2 May Be At Risk	1	2.5 $\pm$ 7.0
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	3 Sensitive	1	2.5 $\pm$ 7.0
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	3	2.5 $\pm$ 7.0

	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	4	4.3 ± 0.0
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	4 Secure	4	3.6 ± 0.0
A	<i>Tringa flavipes</i>	Lesser Yellowlegs				S3M	4 Secure	2	3.6 ± 0.0
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	2	4.3 ± 0.0
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	4	4.3 ± 0.0
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	4 Secure	1	4.3 ± 0.0
A	<i>Calidris alba</i>	Sanderling				S3M,S2N	4 Secure	2	4.3 ± 0.0
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	4 Secure	1	2.5 ± 7.0
A	<i>Anas discors</i>	Blue-winged Teal				S3S4B	2 May Be At Risk	1	2.5 ± 7.0
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B	3 Sensitive	4	2.5 ± 7.0
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	5	2.5 ± 7.0
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	3	2.5 ± 7.0
A	<i>Catharus fuscescens</i>	Veery				S3S4B	4 Secure	5	2.5 ± 0.0
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	1	2.5 ± 7.0

### 4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species “location sensitive”. Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting your study area are indicated below with “YES”.

#### Nova Scotia

Scientific Name	Common Name	SARA	Prov Legal Prot	Known within the Study Site?
<i>Fraxinus nigra</i>	Black Ash		Threatened	No
<i>Emydoidea blandingii</i>	Blanding's Turtle - Nova Scotia pop.	Endangered	Vulnerable	No
<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	No
<i>Falco peregrinus pop. 1</i>	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
<i>Bat Hibernaculum</i>		[Endangered] <sup>1</sup>	[Endangered] <sup>1</sup>	No

<sup>1</sup> *Myotis lucifugus* (Little Brown Myotis), *Myotis septentrionalis* (Long-eared Myotis), and *Perimyotis subflavus* (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the NS Endangered Species Act.

### 4.4 SOURCE BIBLIOGRAPHY

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
68	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
31	Morrison, Guy. 2011. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Ottawa, 15939 surveys. 86171 recs.
15	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
13	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
12	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
5	Staff, DNR 2007. Restricted & Limited Use Land Database (RLUL).
3	Canadian Wildlife Service, Dartmouth. 2010. Piping Plover censuses 2007-09, 304 recs.
2	Amirault, D.L. & McKnight, J. 2003. Piping Plover Database 1991-2003. Canadian Wildlife Service, Sackville, unpublished data. 7 recs.
2	Benjamin, L.K. (compiler) 2012. Significant Habitat & Species Database. NS Dept of Natural Resources.
2	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2013.
2	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: <a href="http://luxor.acadiau.ca/library/Herbarium/project/">http://luxor.acadiau.ca/library/Herbarium/project/</a> . 582 recs.
2	Roland, A.E. & Smith, E.C. 1969. The Flora of Nova Scotia, 1st Ed. Nova Scotia Museum, Halifax, 743pp.
2	Wilhelm, S.I. et al. 2011. Colonial Waterbird Database.
1	Atlantic Canada Conservation Area Database (ARCAD)
1	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
1	Blaney, C.S.; Mazerolle, D.M.; Oberndorfer, E. 2007. Fieldwork 2007. Atlantic Canada Conservation Data Centre. Sackville NB, 13770 recs.

# recs	CITATION
1	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
1	Pronych, G. & Wilson, A. 1993. Atlas of Rare Vascular Plants in Nova Scotia. Nova Scotia Museum, Halifax NS, I:1-168, II:169-331. 1446 recs.
1	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.

## 5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 31437 records of 133 vertebrate and 783 records of 55 invertebrate fauna; 4288 records of 274 vascular, 831 records of 60 nonvascular flora (attached: \*ob100km.xls).

Taxa within 100 km of the study site that are rare and/or endangered in the province in which the study site occurs. All ranks correspond to the province in which the study site falls, even for out-of-province records. Taxa are listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation ( $\pm$  the precision, in km, of the record).

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Myotis lucifugus</i>	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	63	15.9 $\pm$ 0.0	NS
A	<i>Myotis septentrionalis</i>	Northern Long-eared Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	97	39.7 $\pm$ 1.0	PE
A	<i>Perimyotis subflavus</i>	Eastern Pipistrelle	Endangered	Endangered	Endangered	S1	1 At Risk	4	81.6 $\pm$ 5.0	NS
A	<i>Salmo salar</i> pop. 1	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered		S1	2 May Be At Risk	13	35.2 $\pm$ 0.0	NS
A	<i>Charadrius melodus melodus</i>	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	2228	2.4 $\pm$ 1.0	NS
A	<i>Sterna dougallii</i>	Roseate Tern	Endangered	Endangered	Endangered	S1B	1 At Risk	23	85.0 $\pm$ 0.0	NS
A	<i>Morone saxatilis</i> pop. 2	Striped Bass- Bay of Fundy pop.	Endangered			S1B	2 May Be At Risk	1	95.4 $\pm$ 0.0	NS
A	<i>Calidris canutus rufa</i>	Red Knot rufa ssp	Endangered		Endangered	S2M	1 At Risk	232	11.5 $\pm$ 0.0	NS
A	<i>Caprimulgus vociferus</i>	Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	1 At Risk	7	47.9 $\pm$ 7.0	NS
A	<i>Catharus bicknelli</i>	Bicknell's Thrush	Threatened	Special Concern	Endangered	S1S2B	1 At Risk	1	96.5 $\pm$ 7.0	NS
A	<i>Glyptemys insculpta</i>	Wood Turtle	Threatened	Threatened	Threatened	S2	3 Sensitive	208	10.6 $\pm$ 1.0	NS
A	<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	Threatened			S2	2 May Be At Risk	2	83.1 $\pm$ 0.0	NS
A	<i>Anguilla rostrata</i>	American Eel	Threatened			S2	4 Secure	6	77.7 $\pm$ 0.0	NS
A	<i>Chordeiles minor</i>	Common Nighthawk	Threatened	Threatened	Threatened	S2B	1 At Risk	286	2.5 $\pm$ 7.0	NS
A	<i>Contopus cooperi</i>	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S2B	1 At Risk	855	2.5 $\pm$ 7.0	NS
A	<i>Chaetura pelagica</i>	Chimney Swift	Threatened	Threatened	Endangered	S2B,S1M	1 At Risk	189	8.6 $\pm$ 0.0	NS
A	<i>Hirundo rustica</i>	Barn Swallow	Threatened		Endangered	S2S3B	1 At Risk	853	2.5 $\pm$ 7.0	NS
A	<i>Riparia riparia</i>	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	467	2.5 $\pm$ 7.0	NS
A	<i>Wilsonia canadensis</i>	Canada Warbler	Threatened	Threatened	Endangered	S3B	1 At Risk	658	2.5 $\pm$ 7.0	NS
A	<i>Dolichonyx oryzivorus</i>	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	644	2.5 $\pm$ 7.0	NS
A	<i>Hylocichla mustelina</i>	Wood Thrush	Threatened			SUB	5 Undetermined	32	2.5 $\pm$ 7.0	NS
A	<i>Passerculus sandwichensis princeps</i>	Savannah Sparrow princeps ssp	Special Concern	Special Concern		S1B	3 Sensitive	2	91.5 $\pm$ 7.0	NS
A	<i>Falco peregrinus</i> pop. 1	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Vulnerable	S1B,SNAM	3 Sensitive	3	74.0 $\pm$ 0.0	PE
A	<i>Bucephala islandica</i> (Eastern pop.)	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern		S1N	1 At Risk	5	5.5 $\pm$ 0.0	NS
A	<i>Asio flammeus</i>	Short-eared Owl	Special Concern	Special Concern		S1S2B	2 May Be At Risk	11	11.6 $\pm$ 7.0	NS
A	<i>Euphagus carolinus</i>	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	228	13.8 $\pm$ 7.0	NS
A	<i>Histrionicus histrionicus</i> pop. 1	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	22	86.6 $\pm$ 2.0	NS
A	<i>Phalaropus lobatus</i>	Red-necked Phalarope	Special Concern			S2S3M	3 Sensitive	5	76.1 $\pm$ 0.0	NS
A	<i>Morone saxatilis</i> pop. 1	Striped Bass- Southern Gulf of St Lawrence pop.	Special Concern			S2S3N	2 May Be At Risk	1	57.1 $\pm$ 1.0	NS
A	<i>Chelydra serpentina</i>	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	39	14.5 $\pm$ 0.0	NS
A	<i>Contopus virens</i>	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	630	2.5 $\pm$ 7.0	NS
A	<i>Coccythraustes vesperinus</i>	Evening Grosbeak	Special Concern			S3S4B,S3N	4 Secure	377	2.5 $\pm$ 7.0	NS
A	<i>Phocoena phocoena</i> (NW Atlantic pop.)	Harbour Porpoise - Northwest Atlantic pop.	Special Concern	Threatened		S4		1	74.4 $\pm$ 5.0	PE
A	<i>Accipiter cooperii</i>	Cooper's Hawk	Not At Risk			S1?B	5 Undetermined	2	15.6 $\pm$ 0.0	NS
A	<i>Fulica americana</i>	American Coot	Not At Risk			S1B	5 Undetermined	17	21.2 $\pm$ 7.0	NS
A	<i>Sorex dispar</i>	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	2	86.2 $\pm$ 5.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	<i>Aegolius funereus</i>	Boreal Owl	Not At Risk			S2?B	5 Undetermined	19	31.8 ± 0.0	NS
A	<i>Globicephala melas</i>	Long-finned Pilot Whale	Not At Risk			S2S3		1	78.3 ± 100.0	NS
A	<i>Hemidactylum scutatum</i>	Four-toed Salamander	Not At Risk			S3	4 Secure	13	47.2 ± 0.0	NS
A	<i>Sterna hirundo</i>	Common Tern	Not At Risk			S3B	3 Sensitive	454	1.9 ± 0.0	NS
A	<i>Sialia sialis</i>	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	44	2.5 ± 7.0	NS
A	<i>Buteo lagopus</i>	Rough-legged Hawk	Not At Risk			S3N	4 Secure	2	88.1 ± 4.0	NS
A	<i>Accipiter gentilis</i>	Northern Goshawk	Not At Risk			S3S4	4 Secure	95	2.5 ± 7.0	NS
A	<i>Lagenorhynchus acutus</i>	Atlantic White-sided Dolphin	Not At Risk			S3S4		1	89.3 ± 1.0	PE
A	<i>Circus cyaneus</i>	Northern Harrier	Not At Risk			S3S4B	4 Secure	437	2.5 ± 7.0	NS
A	<i>Ammodramus nelsoni</i>	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	184	2.5 ± 7.0	NS
A	<i>Alces americanus</i>	Moose			Endangered	S1	1 At Risk	36	22.7 ± 0.0	NS
A	<i>Salmo salar</i>	Atlantic Salmon				S1	2 May Be At Risk	79	13.0 ± 0.0	NS
A	<i>Picoides dorsalis</i>	American Three-toed Woodpecker				S1?	5 Undetermined	10	74.1 ± 0.0	NS
A	<i>Passerina cyanea</i>	Indigo Bunting				S1?B	5 Undetermined	16	45.2 ± 0.0	PE
A	<i>Nycticorax nycticorax</i>	Black-crowned Night-heron				S1B	2 May Be At Risk	1	58.5 ± 7.0	NS
A	<i>Anas acuta</i>	Northern Pintail				S1B	2 May Be At Risk	42	42.1 ± 14.0	PE
A	<i>Oxyura jamaicensis</i>	Ruddy Duck				S1B	4 Secure	6	48.8 ± 0.0	NS
A	<i>Gallinula chloropus</i>	Common Moorhen				S1B	5 Undetermined	10	32.1 ± 7.0	NS
A	<i>Myiarchus crinitus</i>	Great Crested Flycatcher				S1B	2 May Be At Risk	12	16.6 ± 7.0	NS
A	<i>Mimus polyglottos</i>	Northern Mockingbird				S1B	4 Secure	27	2.5 ± 7.0	NS
A	<i>Toxostoma rufum</i>	Brown Thrasher				S1B	5 Undetermined	10	11.6 ± 7.0	NS
A	<i>Vireo gilvus</i>	Warbling Vireo				S1B	5 Undetermined	16	33.3 ± 7.0	NS
A	<i>Dendroica pinus</i>	Pine Warbler				S1B	5 Undetermined	8	16.6 ± 7.0	NS
A	<i>Calidris minutilla</i>	Least Sandpiper				S1B,S3M	4 Secure	484	4.3 ± 0.0	NS
A	<i>Charadrius semipalmatus</i>	Semipalmated Plover				S1B,S3S4M	4 Secure	960	4.3 ± 0.0	NS
A	<i>Pluvialis dominica</i>	American Golden-Plover				S1S2M	3 Sensitive	79	13.3 ± 0.0	NS
A	<i>Limosa haemastica</i>	Hudsonian Godwit				S1S2M	3 Sensitive	271	57.4 ± 0.0	NS
A	<i>Vireo philadelphicus</i>	Philadelphia Vireo				S2?B	5 Undetermined	48	40.0 ± 0.0	PE
A	<i>Anas clypeata</i>	Northern Shoveler				S2B	2 May Be At Risk	24	72.1 ± 7.0	PE
A	<i>Anas strepera</i>	Gadwall				S2B	2 May Be At Risk	57	50.1 ± 0.0	NS
A	<i>Empidonax traillii</i>	Willow Flycatcher				S2B	3 Sensitive	13	42.1 ± 7.0	NS
A	<i>Dendroica tigrina</i>	Cape May Warbler				S2B	3 Sensitive	151	2.5 ± 7.0	NS
A	<i>Piranga olivacea</i>	Scarlet Tanager				S2B	5 Undetermined	13	12.2 ± 7.0	NS
A	<i>Poocetes gramineus</i>	Vesper Sparrow				S2B	2 May Be At Risk	37	20.2 ± 7.0	NS
A	<i>Molothrus ater</i>	Brown-headed Cowbird				S2B	4 Secure	128	2.5 ± 7.0	NS
A	<i>Bucephala clangula</i>	Common Goldeneye				S2B,S5N	4 Secure	168	5.4 ± 13.0	NS
A	<i>Branta bernicla</i>	Brant				S2M	3 Sensitive	2	93.6 ± 0.0	NS
A	<i>Phalacrocorax carbo</i>	Great Cormorant				S2S3	3 Sensitive	172	31.1 ± 7.0	PE
A	<i>Asio otus</i>	Long-eared Owl				S2S3	2 May Be At Risk	37	28.7 ± 0.0	NS
A	<i>Carduelis pinus</i>	Pine Siskin				S2S3	3 Sensitive	299	2.5 ± 7.0	NS
A	<i>Cathartes aura</i>	Turkey Vulture				S2S3B	3 Sensitive	2	71.8 ± 0.0	PE
A	<i>Rallus limicola</i>	Virginia Rail				S2S3B	5 Undetermined	42	7.8 ± 0.0	NS
A	<i>Tringa semipalmata</i>	Willet				S2S3B	2 May Be At Risk	1135	1.9 ± 0.0	NS
A	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow				S2S3B	2 May Be At Risk	216	2.5 ± 7.0	NS
A	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak				S2S3B	3 Sensitive	477	2.5 ± 7.0	NS
A	<i>Icterus galbula</i>	Baltimore Oriole				S2S3B	2 May Be At Risk	52	2.5 ± 7.0	NS
A	<i>Pinicola enucleator</i>	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	82	12.2 ± 7.0	NS
A	<i>Numenius phaeopus hudsonicus</i>	Hudsonian Whimbrel				S2S3M	3 Sensitive	138	11.5 ± 0.0	NS
A	<i>Calidris melanotos</i>	Pectoral Sandpiper				S2S3M	4 Secure	112	4.3 ± 0.0	NS
A	<i>Perisoreus canadensis</i>	Gray Jay				S3	3 Sensitive	387	12.2 ± 7.0	NS
A	<i>Poecile hudsonica</i>	Boreal Chickadee				S3	3 Sensitive	630	2.5 ± 7.0	NS
A	<i>Sitta canadensis</i>	Red-breasted Nuthatch				S3	4 Secure	704	2.5 ± 7.0	NS
A	<i>Alosa pseudoharengus</i>	Alewife				S3	3 Sensitive	18	13.0 ± 0.0	NS
A	<i>Salvelinus fontinalis</i>	Brook Trout				S3	3 Sensitive	30	13.0 ± 0.0	NS
A	<i>Salvelinus namaycush</i>	Lake Trout				S3	3 Sensitive	2	51.2 ± 0.0	NS
A	<i>Calidris maritima</i>	Purple Sandpiper				S3?N	3 Sensitive	15	11.5 ± 0.0	NS
A	<i>Calcarius lapponicus</i>	Lapland Longspur				S3?N	4 Secure	1	93.4 ± 0.0	NS

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A	<i>Falco sparverius</i>	American Kestrel				S3B	4 Secure	446	11.6 ± 7.0	NS
A	<i>Charadrius vociferus</i>	Killdeer				S3B	3 Sensitive	546	2.5 ± 7.0	NS
A	<i>Gallinago delicata</i>	Wilson's Snipe				S3B	3 Sensitive	563	2.5 ± 7.0	NS
A	<i>Sterna paradisaea</i>	Arctic Tern				S3B	2 May Be At Risk	52	53.0 ± 7.0	NS
A	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo				S3B	2 May Be At Risk	101	2.5 ± 7.0	NS
A	<i>Tyrannus tyrannus</i>	Eastern Kingbird				S3B	3 Sensitive	293	2.5 ± 7.0	NS
A	<i>Dumetella carolinensis</i>	Gray Catbird				S3B	2 May Be At Risk	334	2.5 ± 7.0	NS
A	<i>Wilsonia pusilla</i>	Wilson's Warbler				S3B	3 Sensitive	65	8.0 ± 7.0	NS
A	<i>Tringa melanoleuca</i>	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	1268	4.3 ± 0.0	NS
A	<i>Oceanodroma leucorhoa</i>	Leach's Storm-Petrel				S3B,S5M	4 Secure	47	86.0 ± 7.0	NS
A	<i>Rissa tridactyla</i>	Black-legged Kittiwake				S3B,S5N	3 Sensitive	1	51.4 ± 0.0	NS
A	<i>Fratercula arctica</i>	Atlantic Puffin				S3B,S5N	3 Sensitive	3	86.0 ± 7.0	NS
A	<i>Pluvialis squatarola</i>	Black-bellied Plover				S3M	4 Secure	1154	3.6 ± 0.0	NS
A	<i>Tringa flavipes</i>	Lesser Yellowlegs				S3M	4 Secure	649	3.6 ± 0.0	NS
A	<i>Arenaria interpres</i>	Ruddy Turnstone				S3M	4 Secure	498	4.3 ± 0.0	NS
A	<i>Calidris pusilla</i>	Semipalmated Sandpiper				S3M	3 Sensitive	895	4.3 ± 0.0	NS
A	<i>Calidris fuscicollis</i>	White-rumped Sandpiper				S3M	4 Secure	195	11.5 ± 0.0	NS
A	<i>Limnodromus griseus</i>	Short-billed Dowitcher				S3M	4 Secure	511	4.3 ± 0.0	NS
A	<i>Calidris alba</i>	Sanderling				S3M,S2N	4 Secure	582	4.3 ± 0.0	NS
A	<i>Chroicocephalus ridibundus</i>	Black-headed Gull				S3N	4 Secure	1	98.0 ± 0.0	NB
A	<i>Somateria mollissima</i>	Common Eider				S3S4	4 Secure	355	8.0 ± 9.0	NS
A	<i>Picoides arcticus</i>	Black-backed Woodpecker				S3S4	3 Sensitive	143	12.2 ± 7.0	NS
A	<i>Loxia curvirostra</i>	Red Crossbill				S3S4	4 Secure	95	2.5 ± 7.0	NS
A	<i>Sorex palustris</i>	American Water Shrew				S3S4	4 Secure	4	50.7 ± 0.0	PE
A	<i>Botaurus lentiginosus</i>	American Bittern				S3S4B	3 Sensitive	282	8.9 ± 7.0	NS
A	<i>Anas discors</i>	Blue-winged Teal				S3S4B	2 May Be At Risk	296	2.5 ± 7.0	NS
A	<i>Actitis macularius</i>	Spotted Sandpiper				S3S4B	3 Sensitive	687	2.5 ± 7.0	NS
A	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	563	2.5 ± 7.0	NS
A	<i>Regulus calendula</i>	Ruby-crowned Kinglet				S3S4B	3 Sensitive	1471	2.5 ± 7.0	NS
A	<i>Catharus fuscescens</i>	Veery				S3S4B	4 Secure	415	2.5 ± 0.0	NS
A	<i>Catharus ustulatus</i>	Swainson's Thrush				S3S4B	4 Secure	1212	2.5 ± 7.0	NS
A	<i>Vermivora peregrina</i>	Tennessee Warbler				S3S4B	3 Sensitive	282	12.2 ± 7.0	NS
A	<i>Dendroica castanea</i>	Bay-breasted Warbler				S3S4B	3 Sensitive	404	12.2 ± 7.0	NS
A	<i>Dendroica striata</i>	Blackpoll Warbler				S3S4B	3 Sensitive	90	12.2 ± 7.0	NS
A	<i>Passerella iliaca</i>	Fox Sparrow				S3S4B	4 Secure	62	5.8 ± 0.0	NS
A	<i>Mergus serrator</i>	Red-breasted Merganser				S3S4B,S5N	4 Secure	88	8.0 ± 9.0	NS
A	<i>Bucephala albeola</i>	Bufflehead				S3S4N	4 Secure	22	45.6 ± 9.0	NS
A	<i>Progne subis</i>	Purple Martin				SHB	2 May Be At Risk	4	85.9 ± 7.0	NS
A	<i>Eremophila alpestris</i>	Horned Lark				SHB,S4S5N	4 Secure	5	50.1 ± 7.0	PE
A	<i>Morus bassanus</i>	Northern Gannet				SHB,S5M	4 Secure	30	33.4 ± 13.0	PE
I	<i>Danaus plexippus</i>	Monarch	Endangered	Special Concern		S2B	3 Sensitive	30	8.8 ± 0.0	NS
I	<i>Barnea truncata</i>	Atlantic Mud-piddock	Threatened			S1	1 At Risk	1	93.0 ± 1.0	NS
I	<i>Alasmidonta varicosa</i>	Brook Floater	Special Concern		Threatened	S1S2	3 Sensitive	17	38.9 ± 0.0	NS
I	<i>Bombus terricola</i>	Yellow-banded Bumblebee	Special Concern			S3	3 Sensitive	3	71.9 ± 0.0	PE
I	<i>Satyrium acadica</i>	Acadian Hairstreak				S1	5 Undetermined	10	5.7 ± 1.0	NS
I	<i>Erora laeta</i>	Early Hairstreak				S1	2 May Be At Risk	1	80.9 ± 0.0	PE
I	<i>Neurocordulia michaeli</i>	Broadtailed Shadowdragon				S1		26	41.7 ± 0.0	NS
I	<i>Strophitus undulatus</i>	Creepers				S1	2 May Be At Risk	6	96.8 ± 1.0	NS
I	<i>Polygonia satyrus</i>	Satyr Comma				S1?	3 Sensitive	5	66.3 ± 0.0	PE
I	<i>Nymphalis l-album</i>	Compton Tortoiseshell				S1S2	4 Secure	6	58.0 ± 1.0	NS
I	<i>Somatochlora kennedyi</i>	Kennedy's Emerald				S1S2	2 May Be At Risk	2	71.2 ± 1.0	PE
I	<i>Coenagrion resolutum</i>	Taiga Bluet				S1S2	2 May Be At Risk	51	36.7 ± 1.0	PE
I	<i>Stylurus scudderii</i>	Zebra Clubtail				S1S2	2 May Be At Risk	2	93.6 ± 0.0	NS
I	<i>Lycaena hyllus</i>	Bronze Copper				S2	4 Secure	9	34.4 ± 0.0	PE
I	<i>Lycaena dospassosi</i>	Salt Marsh Copper				S2	1 At Risk	42	11.4 ± 0.0	NS
I	<i>Satyrium calanus</i>	Banded Hairstreak				S2	5 Undetermined	2	68.4 ± 1.0	NS
I	<i>Boloria chariclea</i>	Arctic Fritillary				S2	3 Sensitive	2	53.8 ± 1.0	NS

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	<i>Aglais milberti</i>	Milbert's Tortoiseshell				S2	4 Secure	9	67.2 ± 0.0	NS
	<i>Epitheca princeps</i>	Prince Baskettail				S2	3 Sensitive	9	68.4 ± 0.0	NS
	<i>Somatochlora williamsoni</i>	Williamson's Emerald				S2	2 May Be At Risk	11	81.0 ± 0.0	PE
	<i>Williamsonia fletcheri</i>	Ebony Boghaunter				S2	2 May Be At Risk	4	68.3 ± 0.0	NS
	<i>Margaritifera margaritifera</i>	Eastern Pearlshell				S2	3 Sensitive	141	12.4 ± 0.0	NS
	<i>Pantala hymenaea</i>	Spot-Winged Glider				S2?B	3 Sensitive	1	67.6 ± 1.0	NS
	<i>Thorybes pylades</i>	Northern Cloudywing				S2S3	3 Sensitive	14	5.7 ± 1.0	NS
	<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper				S2S3	4 Secure	3	53.5 ± 0.0	NS
	<i>Satyrium liparops</i>	Striped Hairstreak				S2S3	5 Undetermined	3	70.4 ± 1.0	NS
	<i>Satyrium liparops strigosum</i>	Striped Hairstreak				S2S3	3 Sensitive	1	74.5 ± 10.0	PE
	<i>Euphydryas phaeton</i>	Baltimore Checkerspot				S2S3	4 Secure	29	10.3 ± 1.0	NS
	<i>Gomphus desertus</i>	Harpoon Clubtail				S2S3	3 Sensitive	2	77.8 ± 1.0	NS
	<i>Ophiogomphus aspersus</i>	Brook Snaketail				S2S3	2 May Be At Risk	1	94.8 ± 0.0	NS
	<i>Ophiogomphus mainensis</i>	Maine Snaketail				S2S3	2 May Be At Risk	14	40.7 ± 0.0	NS
	<i>Ophiogomphus rupinsulensis</i>	Rusty Snaketail				S2S3	2 May Be At Risk	39	46.7 ± 0.0	NS
	<i>Somatochlora forcipata</i>	Forcinate Emerald				S2S3	2 May Be At Risk	3	66.3 ± 1.0	PE
	<i>Somatochlora franklini</i>	Delicate Emerald				S2S3	3 Sensitive	6	64.9 ± 1.0	PE
	<i>Alasmidonta undulata</i>	Triangle Floater				S2S3	4 Secure	15	54.1 ± 1.0	NS
	<i>Callophrys henrici</i>	Henry's Elfin				S3	4 Secure	3	54.9 ± 0.0	NS
	<i>Callophrys lanoraieensis</i>	Bog Elfin				S3	2 May Be At Risk	4	49.2 ± 0.0	NS
	<i>Speyeria aphrodite</i>	Aphrodite Fritillary				S3	4 Secure	12	13.4 ± 100.0	NS
	<i>Polygonia faunus</i>	Green Comma				S3	4 Secure	15	32.3 ± 0.0	NS
	<i>Megisto cymela</i>	Little Wood-satyr				S3	4 Secure	9	72.6 ± 0.0	PE
	<i>Oeneis jutta</i>	Jutta Arctic				S3	2 May Be At Risk	7	38.1 ± 0.0	PE
	<i>Aeshna clepsydra</i>	Mottled Darner				S3	4 Secure	4	83.2 ± 1.0	NS
	<i>Aeshna constricta</i>	Lance-Tipped Darner				S3	4 Secure	25	5.4 ± 1.0	NS
	<i>Boyeria grafiata</i>	Ocellated Darner				S3	3 Sensitive	11	53.1 ± 0.0	NS
	<i>Gomphaeschna furcillata</i>	Harlequin Darner				S3	3 Sensitive	1	66.8 ± 0.0	PE
	<i>Somatochlora tenebrosa</i>	Clamp-Tipped Emerald				S3	4 Secure	1	89.9 ± 1.0	PE
	<i>Sympetrum danae</i>	Black Meadowhawk				S3	3 Sensitive	9	57.4 ± 0.0	NS
	<i>Enallagma vernale</i>	Vernal Bluet				S3	5 Undetermined	4	66.3 ± 0.0	PE
	<i>Amphiagrion saucium</i>	Eastern Red Damsel				S3	4 Secure	2	41.2 ± 0.0	NS
	<i>Polygonia interrogationis</i>	Question Mark				S3B	4 Secure	41	5.2 ± 0.0	NS
	<i>Erynnis juvenalis</i>	Juvenal's Duskywing				S3S4	4 Secure	2	54.2 ± 1.0	NS
	<i>Amblyscirtes vialis</i>	Common Roadside-Skipper				S3S4	4 Secure	4	5.7 ± 1.0	NS
	<i>Polygonia progne</i>	Grey Comma				S3S4	4 Secure	22	12.0 ± 1.0	NS
	<i>Lanthus parvulus</i>	Northern Pygmy Clubtail				S3S4	4 Secure	34	39.0 ± 1.0	NS
	<i>Lampsilis radiata</i>	Eastern Lampmussel				S3S4	3 Sensitive	53	17.6 ± 0.0	NS
N	<i>Erioderma pedicellatum</i> (Atlantic pop.)	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	1 At Risk	353	54.2 ± 0.0	NS
N	<i>Erioderma mollissimum</i>	Graceful Felt Lichen	Endangered		Endangered	S1S2	2 May Be At Risk	12	74.8 ± 0.0	NS
N	<i>Peltigera hydrothyria</i>	Eastern Waterfan	Threatened			S1	2 May Be At Risk	2	66.5 ± 1.0	NS
N	<i>Anzia colpodes</i>	Black-foam Lichen	Threatened			S3	3 Sensitive	2	80.7 ± 0.0	NS
N	<i>Sclerophora peronella</i> (Nova Scotia pop.)	Frosted Glass-whiskers Lichen - Nova Scotia pop.	Special Concern	Special Concern		S1?		10	65.5 ± 0.0	NS
N	<i>Degelia plumbea</i>	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	4 Secure	30	33.2 ± 0.0	NS
N	<i>Pseudevernia cladonia</i>	Ghost Antler Lichen	Not At Risk			S2S3	3 Sensitive	2	96.4 ± 0.0	NS
N	<i>Cladonia brevis</i>	Short Peg Lichen				S1		1	95.7 ± 4.0	PE
N	<i>Aloina rigida</i>	Aloe-Like Rigid Screw Moss				S1?	2 May Be At Risk	1	70.0 ± 0.0	NS
N	<i>Brachythecium erythrorrhizon</i>	Taiga Ragged Moss				S1?		2	89.4 ± 0.0	PE
N	<i>Campylostelium saxicola</i>	a Moss				S1?	3 Sensitive	3	80.6 ± 0.0	PE
N	<i>Tortula obtusifolia</i>	a Moss				S1?	5 Undetermined	2	56.6 ± 2.0	NS
N	<i>Lichina confinis</i>	Marine Seaweed Lichen				S1?	6 Not Assessed	1	95.1 ± 2.0	NS
N	<i>Parmeliella parvula</i>	Poor-man's Shingles Lichen				S1?	2 May Be At Risk	1	92.8 ± 0.0	NS
N	<i>Tetradontium brownianum</i>	Little Georgia				S1S2	3 Sensitive	1	92.0 ± 0.0	PE
N	<i>Timmia megalopolitana</i>	Metropolitan Timmia Moss				S1S2	3 Sensitive	1	70.3 ± 0.0	NS
N	<i>Cyrtio-hypnum minutulum</i>	Tiny Cedar Moss				S1S2	3 Sensitive	1	55.5 ± 0.0	NS

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N	<i>Bryohaplocladium microphyllum</i>	Tiny-leaved Haplocladium Moss				S1S2		1	76.3 ± 5.0	NS
N	<i>Anomodon viticulosus</i>	a Moss				S2?	3 Sensitive	1	69.6 ± 5.0	NS
N	<i>Atrichum angustatum</i>	Lesser Smoothcap Moss				S2?	3 Sensitive	3	51.0 ± 3.0	NS
N	<i>Campyllum polygamum</i>	a Moss				S2?	5 Undetermined	1	85.0 ± 0.0	PE
N	<i>Dicranum condensatum</i>	Condensed Broom Moss				S2?	5 Undetermined	1	90.7 ± 0.0	PE
N	<i>Ditrichum rhynchostegium</i>	a Moss				S2?	3 Sensitive	1	42.4 ± 0.0	PE
N	<i>Philonotis marchica</i>	a Moss				S2?	5 Undetermined	2	49.5 ± 0.0	NS
N	<i>Saelania glaucescens</i>	Blue Dew Moss				S2?	3 Sensitive	1	46.8 ± 0.0	NS
N	<i>Cyrtomnium hymenophylloides</i>	Short-pointed Lantern Moss				S2?	3 Sensitive	1	46.8 ± 0.0	NS
N	<i>Leptogium teretiusculum</i>	Beaded Jellyskin Lichen				S2?	3 Sensitive	2	26.8 ± 0.0	NS
N	<i>Peltigera collina</i>	Tree Pelt Lichen				S2?	3 Sensitive	3	69.0 ± 5.0	NS
N	<i>Ephemerum serratum</i>	a Moss				S2S3	3 Sensitive	1	22.4 ± 3.0	NS
N	<i>Eurhynchium hians</i>	Light Beaked Moss				S2S3	3 Sensitive	1	84.0 ± 25.0	NS
N	<i>Platydictya subtilis</i>	Bark Willow Moss				S2S3	3 Sensitive	2	80.6 ± 0.0	PE
N	<i>Tortula truncata</i>	a Moss				S2S3	3 Sensitive	1	70.2 ± 300.0	NS
N	<i>Fuscopannaria leucosticta</i>	Rimmed Shingles Lichen				S2S3	2 May Be At Risk	4	68.2 ± 0.0	NS
N	<i>Leptogium tenuissimum</i>	Birdnest Jellyskin Lichen				S2S3	6 Not Assessed	1	89.5 ± 0.0	NS
N	<i>Parmeliopsis ambigua</i>	Green Starburst Lichen				S2S3	3 Sensitive	1	95.7 ± 4.0	PE
N	<i>Ramalina thrausta</i>	Angelhair Ramalina Lichen				S3	3 Sensitive	1	77.0 ± 0.0	PE
N	<i>Collema nigrescens</i>	Blistered Tarpaper Lichen				S3	3 Sensitive	2	82.6 ± 0.0	NS
N	<i>Sticta fuliginosa</i>	Peppered Moon Lichen				S3	3 Sensitive	11	25.9 ± 2.0	NS
N	<i>Leptogium subtile</i>	Appressed Jellyskin Lichen				S3	3 Sensitive	2	68.9 ± 0.0	NS
N	<i>Fuscopannaria ahneri</i>	Corrugated Shingles Lichen				S3	4 Secure	29	55.0 ± 0.0	NS
N	<i>Heterodermia speciosa</i>	Powdered Fringe Lichen				S3	4 Secure	2	33.3 ± 0.0	NS
N	<i>Leptogium corticola</i>	Blistered Jellyskin Lichen				S3	3 Sensitive	15	55.0 ± 0.0	NS
N	<i>Nephroma bellum</i>	Naked Kidney Lichen				S3	3 Sensitive	2	42.2 ± 0.0	NS
N	<i>Moelleropsis nebulosa</i>	Blue-gray Moss Shingle Lichen				S3	4 Secure	34	64.9 ± 0.0	NS
N	<i>Calliergon giganteum</i>	Giant Spear Moss				S3?	3 Sensitive	1	69.7 ± 2.0	PE
N	<i>Helodium blandowii</i>	Wetland-plume Moss				S3?	4 Secure	1	26.0 ± 3.0	NS
N	<i>Cladina stygia</i>	Black-footed Reindeer Lichen				S3?	3 Sensitive	2	84.8 ± 0.0	NS
N	<i>Dicranum leioneuron</i>	a Dicranum Moss				S3S4	4 Secure	1	96.4 ± 1.0	PE
N	<i>Encalypta procera</i>	Slender Extinguisher Moss				S3S4	4 Secure	2	56.4 ± 0.0	NS
N	<i>Myurella julacea</i>	Small Mouse-tail Moss				S3S4	3 Sensitive	1	46.8 ± 0.0	NS
N	<i>Schistidium agassizii</i>	Elf Bloom Moss				S3S4	4 Secure	1	77.7 ± 3.0	NS
N	<i>Hypogymnia vittata</i>	Slender Monk's Hood Lichen				S3S4	4 Secure	12	96.3 ± 0.0	NS
N	<i>Leptogium saturninum</i>	Bearded Jellyskin Lichen				S3S4	5 Undetermined	1	26.8 ± 0.0	NS
N	<i>Parmeliopsis hyperopta</i>	Gray Starburst Lichen				S3S4	5 Undetermined	2	22.6 ± 1.0	NS
N	<i>Physconia detersa</i>	Bottlebrush Frost Lichen				S3S4	3 Sensitive	3	80.7 ± 0.0	NS
N	<i>Coccocarpia palmicola</i>	Salted Shell Lichen				S3S4	4 Secure	222	63.3 ± 0.0	NS
N	<i>Anaptychia palmulata</i>	Shaggy Fringed Lichen				S3S4	4 Secure	6	63.4 ± 0.0	NS
N	<i>Bryoria capillaris</i>	Gray Horsehair Lichen				S3S4	5 Undetermined	11	73.3 ± 0.0	PE
N	<i>Evernia prunastri</i>	Valley Oakmoss Lichen				S3S4	3 Sensitive	3	62.0 ± 0.0	PE
N	<i>Heterodermia neglecta</i>	Fringe Lichen				S3S4	4 Secure	11	67.5 ± 0.0	NS
P	<i>Bartonia paniculata ssp. paniculata</i>	Branched Bartonia	Threatened	Threatened		SNA		1	52.8 ± 10.0	NS
P	<i>Lilaeopsis chinensis</i>	Eastern Lilaeopsis	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	16	88.1 ± 0.0	NS
P	<i>Isoetes prototypus</i>	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	10	81.5 ± 0.0	NS
P	<i>Floerkea proserpinacoides</i>	False Mermaidweed	Not At Risk			S2	3 Sensitive	3	52.5 ± 7.0	NS
P	<i>Cypripedium arietinum</i>	Ram's-Head Lady's-Slipper			Endangered	S1	1 At Risk	8	68.1 ± 0.0	NS
P	<i>Thuja occidentalis</i>	Eastern White Cedar			Vulnerable	S1	1 At Risk	27	47.9 ± 7.0	NS
P	<i>Acer saccharinum</i>	Silver Maple				S1	5 Undetermined	1	97.1 ± 20.0	PE
P	<i>Sanicula odorata</i>	Clustered Sanicle				S1	2 May Be At Risk	4	12.2 ± 7.0	NS
P	<i>Zizia aurea</i>	Golden Alexanders				S1	2 May Be At Risk	42	40.5 ± 1.0	NS
P	<i>Antennaria parlinii</i>	a Pussytoes				S1	2 May Be At Risk	1	27.2 ± 0.0	NS
P	<i>Bidens hyperborea</i>	Estuary Beggarticks				S1	2 May Be At Risk	3	57.4 ± 1.0	NS
P	<i>Prenanthes racemosa</i>	Glaucous Rattlesnakeroot				S1	2 May Be At Risk	1	97.1 ± 20.0	PE
P	<i>Ageratina altissima</i>	White Snakeroot				S1	2 May Be At Risk	2	57.4 ± 1.0	NS
P	<i>Barbarea orthoceras</i>	American Yellow Rocket				S1	2 May Be At Risk	7	58.0 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Cochlearia tridactylites</i>	Limestone Scurvy-grass				S1	2 May Be At Risk	8	91.7 ± 0.0	NS
P	<i>Lobelia spicata</i>	Pale-Spiked Lobelia				S1	2 May Be At Risk	6	64.8 ± 7.0	NS
P	<i>Stellaria crassifolia</i>	Fleshy Stitchwort				S1	2 May Be At Risk	2	84.3 ± 5.0	PE
P	<i>Suaeda maritima</i> ssp. <i>richii</i>	White Sea-blite				S1	5 Undetermined	3	58.5 ± 7.0	NS
P	<i>Hudsonia tomentosa</i>	Woolly Beach-heath				S1	2 May Be At Risk	50	8.0 ± 7.0	NS
P	<i>Elatine americana</i>	American Waterwort				S1	2 May Be At Risk	1	95.5 ± 0.0	NS
P	<i>Desmodium canadense</i>	Canada Tick-trefoil				S1	2 May Be At Risk	20	14.0 ± 0.0	NS
P	<i>Ribes americanum</i>	Wild Black Currant				S1	5 Undetermined	2	58.9 ± 5.0	NS
P	<i>Fraxinus americana</i>	White Ash				S1	2 May Be At Risk	93	0.5 ± 2.0	NS
P	<i>Fraxinus pennsylvanica</i>	Red Ash				S1	2 May Be At Risk	3	58.5 ± 0.0	PE
P	<i>Polygonum careyi</i>	Carey's Smartweed				S1	5 Undetermined	1	69.6 ± 3.0	NS
P	<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup				S1	2 May Be At Risk	25	73.1 ± 0.0	NS
P	<i>Salix myrtillifolia</i>	Blueberry Willow				S1	2 May Be At Risk	1	84.0 ± 0.0	NS
P	<i>Salix serissima</i>	Autumn Willow				S1	2 May Be At Risk	2	84.0 ± 0.0	NS
P	<i>Agalinis paupercula</i> var. <i>borealis</i>	Small-flowered Agalinis				S1		1	8.3 ± 0.0	NS
P	<i>Scrophularia lanceolata</i>	Lance-leaved Figwort				S1	5 Undetermined	1	93.3 ± 1.0	NS
P	<i>Dirca palustris</i>	Eastern Leatherwood				S1	2 May Be At Risk	5	87.3 ± 7.0	NS
P	<i>Boehmeria cylindrica</i>	Small-spike False-nettle				S1	2 May Be At Risk	2	96.6 ± 0.0	NS
P	<i>Pilea pumila</i>	Dwarf Clearweed				S1	2 May Be At Risk	25	19.8 ± 6.0	NS
P	<i>Carex alopecoidea</i>	Foxtail Sedge				S1	2 May Be At Risk	2	67.6 ± 0.0	NS
P	<i>Carex chordorrhiza</i>	Creeping Sedge				S1	2 May Be At Risk	1	84.1 ± 1.0	PE
P	<i>Carex garberi</i>	Garber's Sedge				S1	2 May Be At Risk	4	41.5 ± 0.0	NS
P	<i>Carex gynocrates</i>	Northern Bog Sedge				S1	2 May Be At Risk	2	84.0 ± 0.0	NS
P	<i>Carex haydenii</i>	Hayden's Sedge				S1	2 May Be At Risk	3	35.5 ± 5.0	NS
P	<i>Carex pellita</i>	Woolly Sedge				S1	2 May Be At Risk	12	13.9 ± 0.0	NS
P	<i>Carex plantaginea</i>	Plantain-Leaved Sedge				S1	2 May Be At Risk	3	43.1 ± 0.0	NS
P	<i>Carex prairea</i>	Prairie Sedge				S1	2 May Be At Risk	1	80.9 ± 0.0	PE
P	<i>Carex tincta</i>	Tinged Sedge				S1	2 May Be At Risk	2	67.6 ± 1.0	NS
P	<i>Carex viridula</i> var. <i>saxillitoralis</i>	Greenish Sedge				S1	2 May Be At Risk	2	97.0 ± 0.0	NS
P	<i>Carex grisea</i>	Inflated Narrow-leaved Sedge				S1	2 May Be At Risk	6	57.8 ± 0.0	NS
P	<i>Cyperus lupulinus</i>	Hop Flatsedge				S1	2 May Be At Risk	5	66.2 ± 0.0	NS
P	<i>Cyperus lupulinus</i> ssp. <i>macilentus</i>	Hop Flatsedge				S1	2 May Be At Risk	10	2.6 ± 0.0	NS
P	<i>Blysmus rufus</i>	Red Bulrush				S1	2 May Be At Risk	1	93.6 ± 5.0	PE
P	<i>Iris prismatica</i>	Slender Blue Flag				S1	2 May Be At Risk	2	60.2 ± 1.0	NS
P	<i>Juncus vaseyi</i>	Vasey Rush				S1	2 May Be At Risk	3	46.4 ± 0.0	NS
P	<i>Allium tricoccum</i>	Wild Leek				S1	2 May Be At Risk	8	38.4 ± 0.0	NS
P	<i>Malaxis brachypoda</i>	White Adder's-Mouth				S1	2 May Be At Risk	2	88.6 ± 7.0	NS
P	<i>Bromus latiglumis</i>	Broad-Glumed Brome				S1	2 May Be At Risk	31	46.3 ± 0.0	NS
P	<i>Elymus wiegandii</i>	Wiegand's Wild Rye				S1	2 May Be At Risk	21	11.8 ± 1.0	NS
P	<i>Elymus hystrix</i> var. <i>bigeloviana</i>	Spreading Wild Rye				S1	2 May Be At Risk	4	26.6 ± 1.0	NS
P	<i>Potamogeton nodosus</i>	Long-leaved Pondweed				S1	2 May Be At Risk	1	89.4 ± 5.0	NS
P	<i>Adiantum pedatum</i>	Northern Maidenhair Fern				S1	2 May Be At Risk	1	60.1 ± 1.0	NS
P	<i>Solidago hispida</i>	Hairy Goldenrod				S1?	2 May Be At Risk	1	52.0 ± 7.0	NS
P	<i>Crataegus robinsonii</i>	Robinson's Hawthorn				S1?	5 Undetermined	3	7.8 ± 1.0	NS
P	<i>Carex pensylvanica</i>	Pennsylvania Sedge				S1?	2 May Be At Risk	1	81.5 ± 0.0	NS
P	<i>Carex rostrata</i>	Narrow-leaved Beaked Sedge				S1?	2 May Be At Risk	1	83.9 ± 5.0	PE
P	<i>Schoenoplectus robustus</i>	Sturdy Bulrush				S1?	5 Undetermined	2	64.8 ± 7.0	NS
P	<i>Dichanthelium acuminatum</i> var. <i>lindheimeri</i>	Woolly Panic Grass				S1?	5 Undetermined	1	10.3 ± 0.0	NS
P	<i>Fraxinus nigra</i>	Black Ash			Threatened	S1S2	1 At Risk	129	13.1 ± 0.0	NS
P	<i>Rudbeckia laciniata</i>	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	22	38.6 ± 0.0	NS
P	<i>Proserpinaca intermedia</i>	Intermediate Mermidweed				S1S2	2 May Be At Risk	1	89.4 ± 0.0	NS
P	<i>Anemone virginiana</i> var. <i>alba</i>	Virginia Anemone				S1S2	3 Sensitive	5	50.1 ± 5.0	NS
P	<i>Hepatica nobilis</i> var. <i>obtusata</i>	Round-lobed Hepatica				S1S2	2 May Be At Risk	23	26.3 ± 0.0	NS
P	<i>Parnassia palustris</i> var. <i>parviflora</i>	Marsh Grass-of-Parnassus				S1S2	2 May Be At Risk	1	39.4 ± 1.0	NS
P	<i>Gratiola neglecta</i>	Clammy Hedge-Hyssop				S1S2	3 Sensitive	5	61.5 ± 0.0	NS
P	<i>Carex livida</i> var. <i>radicalis</i>	Livid Sedge				S1S2	2 May Be At Risk	12	63.5 ± 0.0	NS

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P	<i>Juncus greenii</i>	Greene's Rush				S1S2	2 May Be At Risk	4	65.7 ± 1.0	NS
P	<i>Juncus alpinoarticulatus</i> ssp. <i>nodulosus</i>	Richardson's Rush				S1S2	2 May Be At Risk	6	87.8 ± 1.0	PE
P	<i>Platanthera huronensis</i>	Fragrant Green Orchid				S1S2	5 Undetermined	3	39.6 ± 10.0	NS
P	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	Slim-stemmed Reed Grass				S1S2	3 Sensitive	1	94.6 ± 2.0	PE
P	<i>Cinna arundinacea</i>	Sweet Wood Reed Grass				S1S2	2 May Be At Risk	19	57.3 ± 0.0	NS
P	<i>Festuca subverticillata</i>	Nodding Fescue				S1S2	2 May Be At Risk	2	89.0 ± 1.0	NS
P	<i>Sparganium hyperboreum</i>	Northern Burreed				S1S2	3 Sensitive	1	97.8 ± 0.0	NS
P	<i>Carex vacillans</i>	Estuarine Sedge				S1S3	5 Undetermined	2	67.6 ± 0.0	NS
P	<i>Conioselinum chinense</i>	Chinese Hemlock-parsley				S2	3 Sensitive	1	23.9 ± 5.0	NS
P	<i>Osmorhiza longistylis</i>	Smooth Sweet Cicely				S2	2 May Be At Risk	19	13.8 ± 0.0	NS
P	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				S2	3 Sensitive	4	47.9 ± 7.0	NS
P	<i>Lactuca hirsuta</i> var. <i>sanguinea</i>	Hairy Lettuce				S2	3 Sensitive	2	72.1 ± 5.0	PE
P	<i>Symphotrichum ciliolatum</i>	Fringed Blue Aster				S2	3 Sensitive	17	15.2 ± 0.0	NS
P	<i>Impatiens pallida</i>	Pale Jewelweed				S2	3 Sensitive	2	58.5 ± 7.0	NS
P	<i>Caulophyllum thalictroides</i>	Blue Cohosh				S2	2 May Be At Risk	48	7.8 ± 1.0	NS
P	<i>Arabis drummondii</i>	Drummond's Rockcress				S2	3 Sensitive	6	47.4 ± 0.0	NS
P	<i>Cardamine parviflora</i> var. <i>arenicola</i>	Small-flowered Bittercress				S2	3 Sensitive	2	99.1 ± 0.0	NS
P	<i>Stellaria humifusa</i>	Saltmarsh Starwort				S2	3 Sensitive	9	71.3 ± 1.0	PE
P	<i>Stellaria longifolia</i>	Long-leaved Starwort				S2	3 Sensitive	11	35.5 ± 0.0	NS
P	<i>Chenopodium rubrum</i>	Red Pigweed				S2	2 May Be At Risk	7	2.5 ± 7.0	NS
P	<i>Hudsonia ericoides</i>	Pinebarren Golden Heather				S2	3 Sensitive	12	87.3 ± 0.0	PE
P	<i>Hypericum majus</i>	Large St John's-wort				S2	3 Sensitive	6	80.5 ± 0.0	PE
P	<i>Crassula aquatica</i>	Water Pygmyweed				S2	3 Sensitive	6	80.2 ± 5.0	PE
P	<i>Myriophyllum farwellii</i>	Farwell's Water Milfoil				S2	3 Sensitive	10	38.5 ± 1.0	NS
P	<i>Myriophyllum verticillatum</i>	Whorled Water Milfoil				S2	3 Sensitive	1	56.7 ± 0.0	NS
P	<i>Oenothera fruticosa</i> ssp. <i>glauca</i>	Narrow-leaved Evening Primrose				S2	5 Undetermined	3	8.9 ± 7.0	NS
P	<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb				S2	3 Sensitive	16	35.0 ± 1.0	PE
P	<i>Rumex salicifolius</i> var. <i>mexicanus</i>	Triangular-valve Dock				S2	3 Sensitive	4	79.4 ± 0.0	NS
P	<i>Primula mistassinica</i>	Mistassini Primrose				S2	3 Sensitive	16	46.9 ± 7.0	NS
P	<i>Anemone canadensis</i>	Canada Anemone				S2	2 May Be At Risk	2	84.8 ± 1.0	NS
P	<i>Anemone quinquefolia</i>	Wood Anemone				S2	3 Sensitive	17	55.4 ± 0.0	NS
P	<i>Anemone virginiana</i>	Virginia Anemone				S2	3 Sensitive	21	15.5 ± 1.0	NS
P	<i>Anemone virginiana</i> var. <i>virginiana</i>	Virginia Anemone				S2	3 Sensitive	1	66.5 ± 7.0	NS
P	<i>Caltha palustris</i>	Yellow Marsh Marigold				S2	3 Sensitive	31	15.1 ± 0.0	NS
P	<i>Galium boreale</i>	Northern Bedstraw				S2	2 May Be At Risk	2	81.1 ± 5.0	NS
P	<i>Galium labradoricum</i>	Labrador Bedstraw				S2	3 Sensitive	89	55.4 ± 0.0	NS
P	<i>Salix pedicellaris</i>	Bog Willow				S2	3 Sensitive	52	8.9 ± 7.0	NS
P	<i>Comandra umbellata</i>	Bastard's Toadflax				S2	2 May Be At Risk	41	63.8 ± 5.0	NS
P	<i>Tiarella cordifolia</i>	Heart-leaved Foamflower				S2	3 Sensitive	217	31.4 ± 7.0	NS
P	<i>Viola nephrophylla</i>	Northern Bog Violet				S2	3 Sensitive	9	16.0 ± 0.0	NS
P	<i>Carex bebbii</i>	Bebb's Sedge				S2	3 Sensitive	20	38.5 ± 0.0	PE
P	<i>Carex castanea</i>	Chestnut Sedge				S2	2 May Be At Risk	22	83.7 ± 0.0	NS
P	<i>Carex comosa</i>	Bearded Sedge				S2	3 Sensitive	3	55.3 ± 0.0	PE
P	<i>Carex hystericina</i>	Porcupine Sedge				S2	2 May Be At Risk	5	31.6 ± 0.0	NS
P	<i>Carex tenera</i>	Tender Sedge				S2	3 Sensitive	8	23.0 ± 1.0	NS
P	<i>Carex tuckermanii</i>	Tuckerman's Sedge				S2	3 Sensitive	4	14.6 ± 0.0	NS
P	<i>Eleocharis quinqueflora</i>	Few-flowered Spikerush				S2	3 Sensitive	1	88.2 ± 3.0	PE
P	<i>Vallisneria americana</i>	Wild Celery				S2	2 May Be At Risk	3	71.5 ± 1.0	NS
P	<i>Allium schoenoprasum</i> var. <i>sibiricum</i>	Wild Chives				S2	2 May Be At Risk	1	60.8 ± 7.0	NS
P	<i>Lilium canadense</i>	Canada Lily				S2	2 May Be At Risk	85	2.5 ± 7.0	NS
P	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Yellow Lady's-slipper				S2	3 Sensitive	8	14.9 ± 7.0	NS
P	<i>Cypripedium reginae</i>	Showy Lady's-Slipper				S2	2 May Be At Risk	68	13.0 ± 0.0	NS
P	<i>Goodyera pubescens</i>	Downy Rattlesnake-Plantain				S2	3 Sensitive	1	91.7 ± 1.0	NS
P	<i>Platanthera flava</i> var. <i>herbiola</i>	Pale Green Orchid				S2	5 Undetermined	8	31.0 ± 0.0	NS
P	<i>Platanthera macrophylla</i>	Large Round-Leaved Orchid				S2	3 Sensitive	11	29.0 ± 5.0	NS

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P	<i>Spiranthes lucida</i>	Shining Ladies'-Tresses				S2	2 May Be At Risk	21	13.4 ± 1.0	NS
P	<i>Calamagrostis stricta</i>	Slim-stemmed Reed Grass				S2	3 Sensitive	11	66.2 ± 0.0	PE
P	<i>Dichanthelium linearifolium</i>	Narrow-leaved Panic Grass				S2	3 Sensitive	4	11.5 ± 7.0	NS
P	<i>Piptatherum canadense</i>	Canada Rice Grass				S2	3 Sensitive	6	66.6 ± 1.0	NS
P	<i>Potamogeton friesii</i>	Fries' Pondweed				S2	2 May Be At Risk	22	39.1 ± 0.0	PE
P	<i>Potamogeton richardsonii</i>	Richardson's Pondweed				S2	2 May Be At Risk	5	5.8 ± 0.0	NS
P	<i>Dryopteris fragrans var. remotiuscula</i>	Fragrant Wood Fern				S2	3 Sensitive	5	47.2 ± 7.0	NS
P	<i>Woodsia glabella</i>	Smooth Cliff Fern				S2	3 Sensitive	1	77.4 ± 1.0	NS
P	<i>Symphotrichum boreale</i>	Boreal Aster				S2?	3 Sensitive	16	60.8 ± 7.0	NS
P	<i>Cuscuta cephalanthi</i>	Buttonbush Dodder				S2?	5 Undetermined	5	3.8 ± 1.0	NS
P	<i>Epilobium coloratum</i>	Purple-veined Willowherb				S2?	3 Sensitive	3	4.5 ± 1.0	NS
P	<i>Rumex maritimus var. persicarioides</i>	Peach-leaved Dock				S2?	2 May Be At Risk	6	69.1 ± 5.0	PE
P	<i>Crataegus submollis</i>	Quebec Hawthorn				S2?	5 Undetermined	4	27.9 ± 7.0	NS
P	<i>Carex peckii</i>	White-Tinged Sedge				S2?	2 May Be At Risk	3	55.1 ± 0.0	NS
P	<i>Eleocharis ovata</i>	Ovate Spikerush				S2?	3 Sensitive	6	38.9 ± 0.0	NS
P	<i>Scirpus pedicellatus</i>	Stalked Bulrush				S2?	3 Sensitive	9	56.8 ± 0.0	NS
P	<i>Potamogeton pulcher</i>	Spotted Pondweed			Vulnerable	S2S3	3 Sensitive	3	63.7 ± 2.0	NS
P	<i>Hieracium robinsonii</i>	Robinson's Hawkweed				S2S3	3 Sensitive	3	33.8 ± 7.0	NS
P	<i>Senecio pseudoarnica</i>	Seabeach Ragwort				S2S3	3 Sensitive	12	60.8 ± 7.0	NS
P	<i>Betula michauxii</i>	Michaux's Dwarf Birch				S2S3	3 Sensitive	15	67.8 ± 0.0	NS
P	<i>Sagina nodosa</i>	Knotted Pearlwort				S2S3	4 Secure	4	85.8 ± 0.0	PE
P	<i>Sagina nodosa ssp. borealis</i>	Knotted Pearlwort				S2S3	4 Secure	7	86.1 ± 5.0	PE
P	<i>Ceratophyllum echinatum</i>	Prickly Hornwort				S2S3	3 Sensitive	8	57.4 ± 0.0	NS
P	<i>Hypericum dissimulatum</i>	Disguised St John's-wort				S2S3	3 Sensitive	2	82.3 ± 1.0	NS
P	<i>Triosteum aurantiacum</i>	Orange-fruited Tinker's Weed				S2S3	3 Sensitive	75	7.8 ± 1.0	NS
P	<i>Shepherdia canadensis</i>	Soapberry				S2S3	3 Sensitive	2	96.3 ± 0.0	NS
P	<i>Empetrum eamesii ssp. atropurpureum</i>	Pink Crowberry				S2S3	3 Sensitive	6	87.6 ± 5.0	PE
P	<i>Empetrum eamesii ssp. eamesii</i>	Pink Crowberry				S2S3	3 Sensitive	2	72.1 ± 5.0	PE
P	<i>Chamaesyce polygonifolia</i>	Seaside Spurge				S2S3	3 Sensitive	14	22.5 ± 2.0	NS
P	<i>Halenia deflexa</i>	Spurred Gentian				S2S3	3 Sensitive	19	76.6 ± 1.0	NS
P	<i>Hedeoma pulegioides</i>	American False Pennyroyal				S2S3	3 Sensitive	6	7.5 ± 5.0	NS
P	<i>Polygonum buxiforme</i>	Small's Knotweed				S2S3	5 Undetermined	3	6.1 ± 0.0	NS
P	<i>Polygonum raii</i>	Sharp-fruited Knotweed				S2S3	5 Undetermined	9	86.2 ± 1.0	PE
P	<i>Amelanchier fernaldii</i>	Fernald's Serviceberry				S2S3	5 Undetermined	4	86.8 ± 0.0	PE
P	<i>Potentilla canadensis</i>	Canada Cinquefoil				S2S3	3 Sensitive	1	78.5 ± 5.0	NS
P	<i>Galium aparine</i>	Common Bedstraw				S2S3	3 Sensitive	15	18.4 ± 4.0	NS
P	<i>Salix pellita</i>	Satiny Willow				S2S3	3 Sensitive	5	61.4 ± 0.0	NS
P	<i>Veronica serpyllifolia ssp. humifusa</i>	Thyme-Leaved Speedwell				S2S3	3 Sensitive	1	49.7 ± 0.0	NS
P	<i>Carex adusta</i>	Lesser Brown Sedge				S2S3	3 Sensitive	5	59.1 ± 0.0	NS
P	<i>Carex hirtifolia</i>	Pubescent Sedge				S2S3	3 Sensitive	43	12.4 ± 0.0	NS
P	<i>Carex houghtoniana</i>	Houghton's Sedge				S2S3	3 Sensitive	4	72.9 ± 1.0	NS
P	<i>Eleocharis olivacea</i>	Yellow Spikerush				S2S3	3 Sensitive	7	52.1 ± 5.0	NS
P	<i>Eriophorum gracile</i>	Slender Cottongrass				S2S3	3 Sensitive	11	58.5 ± 10.0	NS
P	<i>Coeloglossum viride var. virescens</i>	Long-bracted Frog Orchid				S2S3	2 May Be At Risk	1	85.7 ± 0.0	NS
P	<i>Cypripedium parviflorum</i>	Yellow Lady's-slipper				S2S3	3 Sensitive	20	13.1 ± 0.0	NS
P	<i>Stuckenia filiformis</i>	Thread-leaved Pondweed				S2S3	3 Sensitive	4	72.4 ± 0.0	PE
P	<i>Stuckenia filiformis ssp. alpina</i>	Thread-leaved Pondweed				S2S3	3 Sensitive	4	84.1 ± 1.0	PE
P	<i>Botrychium lanceolatum var. angustisegmentum</i>	Lance-Leaf Grape-Fern				S2S3	3 Sensitive	10	17.3 ± 0.0	NS
P	<i>Botrychium simplex</i>	Least Moonwort				S2S3	3 Sensitive	2	17.3 ± 0.0	NS
P	<i>Ophioglossum pusillum</i>	Northern Adder's-tongue				S2S3	3 Sensitive	7	32.4 ± 0.0	NS
P	<i>Angelica atropurpurea</i>	Purple-stemmed Angelica				S3	4 Secure	8	36.3 ± 1.0	PE
P	<i>Erigeron hyssopifolius</i>	Hyssop-leaved Fleabane				S3	3 Sensitive	19	44.7 ± 0.0	NS
P	<i>Hieracium paniculatum</i>	Panicled Hawkweed				S3	4 Secure	6	31.0 ± 0.0	NS
P	<i>Megalodonta beckii</i>	Water Beggarticks				S3	4 Secure	10	24.1 ± 0.0	NS
P	<i>Packera paupercula</i>	Balsam Groundsel				S3	4 Secure	53	14.3 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Betula pumila</i>	Bog Birch				S3	3 Sensitive	19	63.7 ± 0.0	PE
P	<i>Campanula aparinoides</i>	Marsh Bellflower				S3	3 Sensitive	32	11.9 ± 0.0	NS
P	<i>Minuartia groenlandica</i>	Greenland Stitchwort				S3	3 Sensitive	1	97.5 ± 0.0	NS
P	<i>Viburnum edule</i>	Squashberry				S3	3 Sensitive	2	26.4 ± 0.0	NS
P	<i>Empetrum eamesii</i>	Pink Crowberry				S3	3 Sensitive	13	87.3 ± 0.0	PE
P	<i>Vaccinium boreale</i>	Northern Blueberry				S3	3 Sensitive	2	87.4 ± 1.0	NS
P	<i>Vaccinium caespitosum</i>	Dwarf Bilberry				S3	4 Secure	53	40.8 ± 0.0	NS
P	<i>Geranium bicknellii</i>	Bicknell's Crane's-bill				S3	4 Secure	3	68.4 ± 2.0	NS
P	<i>Proserpinaca palustris</i>	Marsh Mermaidweed				S3	4 Secure	14	56.9 ± 0.0	NS
P	<i>Proserpinaca palustris var. crebra</i>	Marsh Mermaidweed				S3	4 Secure	14	55.3 ± 0.0	NS
P	<i>Proserpinaca pectinata</i>	Comb-leaved Mermaidweed				S3	4 Secure	2	47.0 ± 1.0	NS
P	<i>Teucrium canadense</i>	Canada Germander				S3	3 Sensitive	21	4.8 ± 5.0	NS
P	<i>Decodon verticillatus</i>	Swamp Loosestrife				S3	4 Secure	1	84.6 ± 0.0	PE
P	<i>Epilobium strictum</i>	Downy Willowherb				S3	3 Sensitive	19	58.4 ± 5.0	NS
P	<i>Polygala sanguinea</i>	Blood Milkwort				S3	3 Sensitive	13	7.6 ± 1.0	NS
P	<i>Polygonum pensylvanicum</i>	Pennsylvania Smartweed				S3	4 Secure	13	12.0 ± 0.0	NS
P	<i>Polygonum scandens</i>	Climbing False Buckwheat				S3	3 Sensitive	44	12.3 ± 0.0	NS
P	<i>Plantago rugelii</i>	Rugel's Plantain				S3	4 Secure	5	12.8 ± 0.0	NS
P	<i>Samolus valerandi ssp. parviflorus</i>	Seaside Brookweed				S3	3 Sensitive	17	52.8 ± 1.0	NS
P	<i>Pyrola asarifolia</i>	Pink Pyrola				S3	4 Secure	17	42.7 ± 0.0	NS
P	<i>Pyrola minor</i>	Lesser Pyrola				S3	3 Sensitive	2	32.4 ± 0.0	NS
P	<i>Ranunculus gmelinii</i>	Gmelin's Water Buttercup				S3	4 Secure	64	35.1 ± 5.0	PE
P	<i>Rhamnus alnifolia</i>	Alder-leaved Buckthorn				S3	4 Secure	134	53.3 ± 5.0	PE
P	<i>Agrimonia gryposepala</i>	Hooked Agrimony				S3	4 Secure	109	18.1 ± 0.0	NS
P	<i>Amelanchier stolonifera</i>	Running Serviceberry				S3	4 Secure	15	14.9 ± 2.0	NS
P	<i>Geocaulon lividum</i>	Northern Comandra				S3	4 Secure	6	73.1 ± 0.0	NS
P	<i>Limosella australis</i>	Southern Mudwort				S3	4 Secure	43	39.6 ± 1.0	PE
P	<i>Lindernia dubia</i>	Yellow-seeded False Pimperel				S3	4 Secure	23	11.9 ± 0.0	NS
P	<i>Laportea canadensis</i>	Canada Wood Nettle				S3	3 Sensitive	37	13.2 ± 0.0	NS
P	<i>Verbena hastata</i>	Blue Vervain				S3	4 Secure	106	10.9 ± 0.0	NS
P	<i>Carex cryptolepis</i>	Hidden-scaled Sedge				S3	4 Secure	11	56.2 ± 0.0	NS
P	<i>Carex eburnea</i>	Bristle-leaved Sedge				S3	3 Sensitive	27	44.8 ± 0.0	NS
P	<i>Carex lupulina</i>	Hop Sedge				S3	4 Secure	25	12.0 ± 0.0	NS
P	<i>Carex rosea</i>	Rosy Sedge				S3	4 Secure	16	13.2 ± 0.0	NS
P	<i>Carex tribuloides</i>	Blunt Broom Sedge				S3	4 Secure	9	31.1 ± 2.0	NS
P	<i>Carex wiegandii</i>	Wiegand's Sedge				S3	3 Sensitive	5	39.7 ± 5.0	PE
P	<i>Carex foenea</i>	Fernald's Hay Sedge				S3	4 Secure	15	31.3 ± 0.0	NS
P	<i>Elodea canadensis</i>	Canada Waterweed				S3	4 Secure	6	39.0 ± 0.0	NS
P	<i>Juncus subcaudatus var. planisepalus</i>	Woods-Rush				S3	3 Sensitive	8	5.5 ± 5.0	NS
P	<i>Juncus dudleyi</i>	Dudley's Rush				S3	4 Secure	39	14.0 ± 0.0	NS
P	<i>Goodyera oblongifolia</i>	Menzies' Rattlesnake-plantain				S3	3 Sensitive	1	88.6 ± 0.0	PE
P	<i>Goodyera repens</i>	Lesser Rattlesnake-plantain				S3	3 Sensitive	12	35.9 ± 1.0	PE
P	<i>Listera australis</i>	Southern Twayblade				S3	4 Secure	12	49.4 ± 0.0	NS
P	<i>Platanthera grandiflora</i>	Large Purple Fringed Orchid				S3	4 Secure	95	29.2 ± 0.0	NS
P	<i>Platanthera hookeri</i>	Hooker's Orchid				S3	4 Secure	6	51.3 ± 0.0	NS
P	<i>Platanthera orbiculata</i>	Small Round-leaved Orchid				S3	4 Secure	39	20.5 ± 0.0	NS
P	<i>Spiranthes ochroleuca</i>	Yellow Ladies'-tresses				S3	4 Secure	5	46.1 ± 0.0	NS
P	<i>Alopecurus aequalis</i>	Short-awned Foxtail				S3	4 Secure	19	42.7 ± 1.0	NS
P	<i>Dichanthelium clandestinum</i>	Deer-tongue Panic Grass				S3	4 Secure	84	51.3 ± 0.0	NS
P	<i>Potamogeton obtusifolius</i>	Blunt-leaved Pondweed				S3	4 Secure	10	45.3 ± 0.0	NS
P	<i>Potamogeton praelongus</i>	White-stemmed Pondweed				S3	3 Sensitive	40	17.9 ± 5.0	NS
P	<i>Potamogeton zosteriformis</i>	Flat-stemmed Pondweed				S3	3 Sensitive	11	58.2 ± 0.0	NS
P	<i>Sparganium natans</i>	Small Burreed				S3	4 Secure	16	37.0 ± 1.0	NS
P	<i>Asplenium trichomanes</i>	Maidenhair Spleenwort				S3	4 Secure	1	98.6 ± 0.0	NS
P	<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort				S3	3 Sensitive	2	82.9 ± 7.0	NS
P	<i>Equisetum pratense</i>	Meadow Horsetail				S3	3 Sensitive	9	50.3 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	<i>Equisetum variegatum</i>	Variiegated Horsetail				S3	4 Secure	18	14.0 ± 0.0	NS
P	<i>Isoetes acadensis</i>	Acadian Quillwort				S3	3 Sensitive	2	71.1 ± 1.0	NS
P	<i>Lycopodium sitchense</i>	Sitka Clubmoss				S3	4 Secure	7	52.1 ± 1.0	NS
P	<i>Huperzia appalachiana</i>	Appalachian Fir-Clubmoss				S3	3 Sensitive	6	51.8 ± 5.0	NS
P	<i>Botrychium dissectum</i>	Cut-leaved Moonwort				S3	4 Secure	4	26.2 ± 1.0	NS
P	<i>Polypodium appalachianum</i>	Appalachian Polypody				S3	5 Undetermined	10	33.8 ± 0.0	NS
P	<i>Asclepias incarnata ssp. pulchra</i>	Swamp Milkweed				S3?	5 Undetermined	43	63.2 ± 0.0	NS
P	<i>Polygonum amphibium var. emersum</i>	Water Smartweed				S3?	5 Undetermined	1	95.5 ± 0.0	NS
P	<i>Lycopodium sabinifolium</i>	Ground-Fir				S3?	4 Secure	11	35.1 ± 1.0	NS
P	<i>Atriplex franktonii</i>	Frankton's Saltbush				S3S4	4 Secure	7	38.0 ± 2.0	NS
P	<i>Suaeda calceoliformis</i>	Horned Sea-blite				S3S4	4 Secure	11	0.5 ± 2.0	NS
P	<i>Vaccinium corymbosum</i>	Highbush Blueberry				S3S4	4 Secure	1	87.6 ± 3.0	PE
P	<i>Myriophyllum sibiricum</i>	Siberian Water Milfoil				S3S4	4 Secure	30	51.1 ± 0.0	PE
P	<i>Nuphar lutea ssp. pumila</i>	Small Yellow Pond-lily				S3S4	4 Secure	3	13.9 ± 2.0	NS
P	<i>Sanguinaria canadensis</i>	Bloodroot				S3S4	4 Secure	107	13.1 ± 0.0	NS
P	<i>Polygonum fowleri</i>	Fowler's Knotweed				S3S4	4 Secure	6	58.1 ± 0.0	NS
P	<i>Rumex maritimus</i>	Sea-Side Dock				S3S4		39	1.9 ± 0.0	NS
P	<i>Rumex maritimus var. fueginus</i>	Tierra del Fuego Dock				S3S4	4 Secure	9	72.8 ± 5.0	PE
P	<i>Crataegus succulenta</i>	Fleshy Hawthorn				S3S4	5 Undetermined	5	80.5 ± 5.0	PE
P	<i>Fragaria vesca ssp. americana</i>	Woodland Strawberry				S3S4	4 Secure	59	42.0 ± 1.0	NS
P	<i>Salix petiolaris</i>	Meadow Willow				S3S4	4 Secure	21	26.9 ± 0.0	NS
P	<i>Agalinis neoscotica</i>	Nova Scotia Agalinis				S3S4	4 Secure	2	94.8 ± 0.0	NS
P	<i>Viola sagittata var. ovata</i>	Arrow-Leaved Violet				S3S4	4 Secure	3	71.8 ± 1.0	PE
P	<i>Carex argyrantha</i>	Silvery-flowered Sedge				S3S4	4 Secure	1	45.0 ± 5.0	PE
P	<i>Eriophorum russeolum</i>	Russet Cottongrass				S3S4	4 Secure	15	30.4 ± 5.0	NS
P	<i>Triglochin gaspensis</i>	Gasp Arrowgrass				S3S4	5 Undetermined	25	82.7 ± 5.0	PE
P	<i>Juncus acuminatus</i>	Sharp-Fruit Rush				S3S4	4 Secure	2	95.0 ± 2.0	NS
P	<i>Luzula parviflora</i>	Small-flowered Woodrush				S3S4	4 Secure	2	50.2 ± 0.0	NS
P	<i>Liparis loeselii</i>	Loesel's Twayblade				S3S4	4 Secure	18	34.9 ± 5.0	PE
P	<i>Panicum tuckermanii</i>	Tuckerman's Panic Grass				S3S4	4 Secure	11	72.0 ± 0.0	NS
P	<i>Trisetum spicatum</i>	Narrow False Oats				S3S4	4 Secure	9	16.9 ± 0.0	NS
P	<i>Cystopteris bulbifera</i>	Bulblet Bladder Fern				S3S4	4 Secure	124	44.8 ± 0.0	NS
P	<i>Equisetum hyemale var. affine</i>	Common Scouring-rush				S3S4	4 Secure	22	49.2 ± 0.0	NS
P	<i>Equisetum scirpoides</i>	Dwarf Scouring-Rush				S3S4	4 Secure	37	49.9 ± 0.0	NS
P	<i>Lycopodium complanatum</i>	Northern Clubmoss				S3S4	4 Secure	8	40.5 ± 0.0	NS
P	<i>Schizaea pusilla</i>	Little Curlygrass Fern				S3S4	4 Secure	1	92.9 ± 0.0	NS
P	<i>Solidago simplex var. randii</i>	Sticky Goldenrod				SH	0.1 Extirpated	2	86.8 ± 1.0	NS
P	<i>Viola canadensis</i>	Canada Violet				SH	0.1 Extirpated	1	52.5 ± 7.0	NS

## 5.1 SOURCE BIBLIOGRAPHY (100 km)

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

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16	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
15	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of <i>C. insculpta</i> sightings. Acadia University, Wolfville NS, 88 recs.
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