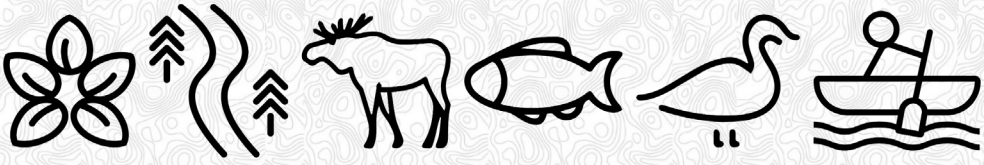
MARTEN FALLS FIRST NATION
ALL SEASON COMMUNITY ACCESS ROAD

FINAL

Wildlife Study Plan

May 2021



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Revision History

Rev #	Date	Revision Description
Draft	May 2020	Submitted “Study Plan –Wildlife DRAFT FOR DISCUSSION” to the Agency
Final	May 2021	Revised to address federal and provincial agency comments

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Acronyms

Agency, the ... Impact Assessment Agency of Canada
ARU ..... Autonomous Recording Unit
CAR ..... Community Access Road
COSEWIC..... Committee on the Status of Endangered Wildlife in Canada
EA..... Environmental Assessment
ELC..... Ecological Land Classification
ENDM ..... Ontario Ministry of Northern Development and Mines
ESA..... *Endangered Species Act, 2007*
GIS..... Geographic Information Systems
IA ..... Impact Assessment
IAA..... *Impact Assessment Act*
IS ..... Impact Statement
km..... kilometre
LSA..... Local Study Area
m..... metre
MECP ..... Ontario Ministry of the Environment, Conservation and Parks
MFFN..... Marten Falls First Nation
MNRF ..... Ontario Ministry of Natural Resources and Forestry
NHIC..... Natural Heritage Information Centre
PDA ..... Project Development Area
RSA ..... Regional Study Area
SAR ..... Species at Risk
SARA..... *Species At Risk Act, 2002*
SOCC ..... Species of Conservation Concern
TISG ..... Tailored Impact Statement Guidelines
ToR..... Terms of Reference
UTM..... Universal Transverse Mercator
VC..... Valued Component
WMU..... Wildlife Management Unit

1. Introduction

The Proponent of the Community Access Road (CAR or the Project) is Marten Falls First Nation (MFFN), a remote First Nation community in northern Ontario located at the junction of the Albany and Ogoki rivers, approximately 430 kilometres (km) from Thunder Bay, Ontario. The MFFN community is proposing an all-season Community Access Road that will connect the MFFN community to Ontario's provincial highway network (Highway 643) to the south via the existing Painter Lake Road. MFFN, as the Proponent of the Project, has formed a MFFN CAR Project Team that includes MFFN CAR Community Member Advisors and MFFN CAR Project Consultants who act with input, guidance and direction from the MFFN Chief and Council.

This document outlines the Study Plan for Wildlife to support a coordinated Impact Assessment (IA) required for Project review by the Impact Assessment Agency of Canada (the Agency) under the federal *Impact Assessment Act* (IAA) and Environmental Assessment (EA) required for Project review by the Ontario Ministry of the Environment, Conservation and Parks (MECP) under the Ontario *Environmental Assessment Act*.

1.1 Federal and Provincial Terminology

The study plans have been prepared using federal terminology, however, the respective provincial terminology has been provided in **Table 1-1** for reference. The terms can be used interchangeably.

Table 1-1: Equivalent Federal and Provincial Terms

Provincial Term	Federal Term
Criteria	Valued Component
Impact Management Measure	Mitigation Measure
Net Effects	Residual Effects
Record of Consultation	Record of Engagement

For the purposes of this Study Plan, Species at Risk (SAR) and Species of Conservation Concern (SOCC) are defined as the following:

- **SAR:**
  - Any species listed under Schedule 1 of the federal *Species at Risk Act*, S.C. 2002, c. 29 (SARA) as Threatened, Endangered, or Extirpated; and / or
  - Any species listed under the provincial *Endangered Species Act, 2007*, S.O. 2007, c. 6 (ESA) as Threatened, Endangered, or Extirpated.
- **SOCC:**
  - Any species listed under Schedule 1 of SARA as Special Concern;
  - Any species designated Threatened, Endangered, or Extirpated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (unless otherwise listed as SAR under SARA or the ESA);
  - Any species listed under the ESA as Special Concern (unless otherwise listed as SAR under SARA); and / or
  - Any species with a subnational rank (SRank[1]) of S1 – S3[2] as designated by the Natural Heritage Information Centre (NHIC).

The *Provincial Policy Statement, 2020* (PPS) protects Significant Wildlife Habitat in Ontario. Significant Wildlife Habitat is defined in the *Natural Heritage Reference Manual* (Ontario Ministry of Natural Resources and Forestry [MNRF], 2010) as the following:

- Habitats of seasonal concentrations of animals
  - areas where animals occur in relatively high densities for the species at specific periods in their life cycles and / or in particular seasons; and
  - seasonal concentration areas, which tend to be localized and relatively small in relation to the area of habitat used at other times of the year.

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1. *A Subnational rank or SRank is a conservation status of a species or plant community within Ontario considering factors such as abundance, distribution, population trends and threats.*
2. *S1 **Critically Imperiled** — Critically imperilled in Ontario. Species with S-ranks of S1 usually have 5 or fewer occurrences in the province or very few remaining individuals. Such species are often especially vulnerable to extirpation.*
   *S2 **Imperiled** — in Ontario. Such species usually have between 6-20 occurrences in the province or have many individuals in fewer occurrences. These species are often susceptible to extirpation.*
   *S3 **Vulnerable** — in Ontario. Such species usually have between 21-100 occurrences in the province. They may also have fewer occurrences but have a large number of individuals in some populations. These species may be susceptible to large-scale disturbances.*

- Rare vegetation communities or specialized habitat for wildlife;
  - rare vegetation communities include
    - areas that contain a provincially rare vegetation community; and
    - areas that contain a vegetation community that is rare within the planning area.
  - specialized wildlife habitats include:
    - areas that support wildlife species that have highly specific habitat requirements;
    - areas with exceptionally high species diversity or community diversity; and
    - areas that provide habitat that greatly enhances species' survival.
- Habitat of SOCC
  - includes the habitat of species that are rare or substantially declining, or have a high percentage of their global population in Ontario;
  - includes Special Concern species identified under the ESA on the Species at Risk in Ontario (SARO) List, which were formally referred to as "vulnerable" in the Significant Wildlife Habitat Technical Guide;
  - species identified as nationally Endangered or Threatened by COSEWIC, which are not protected in regulation under Ontario's ESA; and
  - excludes habitats of Endangered and Threatened species covered under PPS policy 2.1.3(a).
- Animal movement corridors
  - habitats that link two or more wildlife habitats that are critical to the maintenance of a population of a particular species or group of species; and
  - habitats with a key ecological function to enable wildlife to move, with minimum mortality, between areas of Significant Wildlife Habitat or core natural areas.

1.2 Project Study Plans

This Study Plan is one of a group of study plans created for the Project. **Table 1-2** includes the study plans for each environmental[3] discipline currently planned for the Project and the valued components (VCs) covered by the study plans where applicable.

3. *The use of the term environment in this document is inclusive of the components of the environment that are included in the Ontario Environmental Assessment Act definition, which includes a general description of the social, cultural, built and natural environments.*

Table 1-2: Project Study Plans and Valued Components

Environmental Discipline	Study Plan Name	Valued Component(s)
Aboriginal and Treaty Rights and Interests	■ Aboriginal and Treaty Rights and Interests Study Plan	■ Indigenous Current Use of Lands and Resources for Traditional Purposes ■ Cultural Continuity (ability to practice and transmit cultural traditions
Atmospheric Environment	■ Atmospheric Environment and Greenhouse Gases Study Plan	■ Air Quality ■ Greenhouse Gas Emissions
Climate Change	■ Climate Adaptation and Resiliency Study Plan	■ Climate Change
Acoustic and Vibration Environment	■ Acoustic and Vibration Environment Study Plan	■ Noise ■ Vibration
Physiography, Geology, Terrain and Soils	■ Physiography, Terrain and Soils Study Plan	■ Physiography, Terrain and Soils
Surface Water	■ Surface Water Study Plan	■ Surface Water
Groundwater and Geochemistry	■ Groundwater and Geochemistry Study Plan	■ Groundwater
Vegetation	■ Vegetation Study Plan	■ Wetland and Riparian Ecosystems ■ Upland Ecosystems ■ Designated Areas (Areas of Natural and Scientific Interest [ANSI], Environmentally Significant Areas, Significant Woodlands, Critical Landform / Vegetation Associations) ■ Traditional Use Plants and SAR Plant Populations (including species with special conservation status or rarity in the province)
	■ Peatlands Study Plan	■ Peatland Ecosystems (bogs and fens)
Wildlife	■ Wildlife Study Plan	■ Bats (including SAR-bats such as: Little Brown Myotis [*Myotis lucifugus*], Northern Myotis [*Myotis septentrionalis*] and Tri-colored bat [*Perimyotis subflavus*]) ■ Fur Bearers (proxy VC[4] of American Marten [*Martes americana*], Beaver [*Castor canadensis*] and Wolverine [*Gulo gulo*]) ■ Amphibians and Reptiles ■ Pollinating Insects
	■ Ungulates (Moose and Caribou) Study Plan	■ Moose *(Alces alces)* ■ Caribou, boreal population (*Rangifer tarandus*)
	■ Bird Study Plan	■ Forest Birds (proxy VC of Red-eyed Vireo [*Vireo olivaceus*] for deciduous forest, Ovenbird [*Seirus aurocapilla*] for mixedwood forest, Dark-eyed Junco [*Junco hyemalis*] for coniferous forest and disturbed forest

4. *A proxy VC is used when looking at the effects of one species that represents many others.*

Environmental Discipline	Study Plan Name	Valued Component(s)
		■ Raptors (proxy VC of Osprey [*Pandion haliaetus*] for diurnal raptors and Boreal Owl [*Aegolius funereus*] for nocturnal raptors ■ Shorebirds (proxy VC of Wilson's Snipe [*Gallingo delicata*]) ■ Waterfowl (proxy VC of Mallard [*Anas platyrhynchos*]) ■ Bog / Fen Birds and Other Wetland Birds (proxy VC of Palm Warbler [*Setophaga palmarum*] for bogs, Common Yellowthroat [*Geothlypis trichas*] for fens; and Northern Waterthrush [*Parkesia noveboracensis*] for swamps . ■ SAR birds: Canada Warbler (*Cardellina canadensis*), Chimney Swift (*Chaetura pelagica*), Common Nighthawk (*Chordeiles minor*), Eastern Whip-poor-will (*Antrostomus vociferous*), Eastern Wood-Pewee (*Contopus virens*), Evening Grosbeak (*Coccothraustes vespertinus*), Olive-sided Flycatcher (*Contopus cooperi*), Bald Eagle (*Haliaeetus leucocephalus)*, Peregrine Falcon (*Falco peregrinus*), Short-eared Owl (*Asio flammeus)*, Bank Swallow (*Riparia riparia*), Barn Swallow (*Hirundo rustica*), Black Tern (*Childonias niger*), Rusty Blackbird (*Euphagus carolinus*), Yellow Rail (*Coturnicops noveboracensis*)
Fish and Fish Habitat	■ Fish and Fish Habitat Study Plan	■ Lake Sturgeon (*Acipenser fulvescens*) ■ Walleye (*Sander vitreus*) ■ Brook Trout (*Salvelinus fontinalis*) ■ Northern Pike (*Esox lucius*) ■ Lake Whitefish (*Coregonus clupeaformis*) ■ Chain Pickerel (*Esox niger*) ■ Yellow Perch (*Perca flavescens*) ■ Cisco (*Coregonus artedii*) ■ Burbot (*Lota lota*) ■ Longnose Sucker (*Catostomus catostomus*) ■ White Sucker (*Catostomus commersonii*) ■ Forage / Prey Species (including species such as Lake Chub [*Couesius plumbeus*]) ■ Lower Trophic Organisms (e.g., benthic invertebrates)
Social	■ Social Study Plan	■ Housing and Accommodation ■ Community Service and Infrastructure ■ Transportation ■ Community Well-being ■ Populations and Demographics
Economy	■ Economic Study Plan	■ Regional Economy ■ Labour Force and Employment ■ Government Finances

Environmental Discipline	Study Plan Name	Valued Component(s)
Land and Resource Use	■ Land and Resource Use Study Plan	■ Land Use Compatibility ■ Parks and Protected Areas ■ Extractive Industry ■ Forestry Industry ■ Energy and Linear Infrastructure ■ Recreation and Tourism
Human Health and Community Safety	■ Human Health and Community Safety Study Plan	■ Public Safety ■ Public Health ■ Diet ■ Environmental Factors Influencing Health
Visual Aesthetics	■ Visual Aesthetics Study Plan	■ Visual Contrast / Character ■ Visibility ■ Visual Sensitivity
Archaeological and Cultural Heritage	■ Cultural Heritage Study Plan	■ Archaeological Sites and Resources ■ Built Heritage Resources and Cultural Heritage Landscapes

It should be noted that while there is not a Consultation Study Plan, the Project has developed the *Consultation and Engagement Plan to Support the Environmental Assessment / Impact Statement* (AECOM 2020) (referred to as the Impact Assessment [IA] / EA Consultation Plan).

2. Purpose and Objectives

The key objectives of conducting an IA / EA are to describe the existing environment, gather sufficient information to predict Project-related effects (positive and negative, direct and indirect) of the Project and alternatives on the environment, determine measures needed to avoid or minimize adverse Project effects, and enhance beneficial Project effects where feasible, and to undertake consultation and engagement throughout.

The purpose of this Study Plan is to explain:

- The geographic extent of Project areas for wildlife and specific species associated with the direct and indirect effects of the Project works;
- A baseline[5] study methodology that will result in a comprehensive description of the existing environment potentially impacted by the Project;
- How efficient and transparent data management and analysis will be undertaken;
- Effects assessment scoping inputs specific to Wildlife that will allow for potential effects of the Project on the existing environment to be appropriately assessed in the IS / EA Report; and
- How the Study Plan aligns with federal and provincial requirements and guidance, including the Agency's Tailored Impact Statement Guidelines (TISG; the Agency 2020a), dated February 24, 2020, for this Project and applicable provincial agency comments on the Draft Terms of Reference (ToR; AECOM 2019)[6].

Please note that separate study plans have been developed for Birds and Ungulates and therefore, they are not covered in this Wildlife Study Plan.

As required by the IAA and referenced in TISG Section 7.3 (the Agency 2020a), work plans will also be developed, as required. It is anticipated the work plans will include further details on how to action the study plans; for example, they would contain such information as location of sampling sites, scheduling, and sequencing.

5. *Baseline refers to the current conditions of the environment potentially impacted by the Project. Baseline conditions serve as a reference against which changes due to the Project are measured.*
6. *If necessary, the Study Plan will be updated to reflect the approved ToR if approval is obtained.*

For the purposes of establishing appropriate context, the Study Plan begins with background and relevant information on:

- Study Plan related discussions with the Agency, the MECP and applicable agencies to date (**Section 3**);
- The approach to Project consultation and engagement (**Section 4**);
- How Indigenous Knowledge will be collected and used in the IA / EA (**Section 5**); and
- The spatial and temporal boundaries that will be used for the IA / EA (**Section 6**).

2.1 Approach to Handling Confidential Information

2.1.1 Indigenous Knowledge

Permission from the Indigenous community will be sought before including Indigenous Knowledge in the IS / EA Report, regardless of the source of the Indigenous Knowledge. Sensitive and / or confidential information will be specifically collected through the Indigenous Knowledge Program to inform the IS / EA Report, and its use and publication will be governed by Indigenous community-specific Indigenous Knowledge Sharing Agreements. Sensitive and / or confidential information collected through Indigenous Knowledge Sharing Agreements will be protected from public or third-party disclosure and will be established between the Proponent and Indigenous communities participating in the Indigenous Knowledge Program prior to the sharing and use of any sensitive information. Instances where Indigenous Knowledge sharing has taken place during consultation activities (e.g., meetings) will be recorded in the Record of Consultation and Engagement, including where Indigenous Knowledge was incorporated into Project decisions and into the IS / EA Report (i.e., specifics will not be included in the Record of Consultation and Engagement given the potential sensitivity and / or confidentiality of the information shared).

2.1.2 Species at Risk

Sensitive information related to SAR, such as those provided by the MECP or the MNRF, will be presented in materials in accordance with the applicable Sensitive Data Licence Agreements applicable to this Project. Wildlife SAR and SOCC potentially found within the Project Development Area (PDA), Local Study Area (LSA), and / or Regional Study Area (RSA) are listed in **Table 2-1**.

Table 2-1: Non-bird and Non-ungulate Wildlife SAR and SOCC Potentially Found within Study Area

Taxon	Common Name	Scientific Name	COSEWIC Status	SARA Schedule 1 Status	ESA Status
Mammals	Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered	Endangered
Mammals	Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered	Endangered
Mammals	Tri-colored Bat	*Perimyotis subflavus*	Endangered	Endangered	Endangered
Mammals	Wolverine	*Gulo gulo*	Special Concern	Special Concern	Threatened
Reptiles	Snapping Turtle	*Chelydra serpentina*	Special Concern	Special Concern	Special Concern

3. Study Plan Technical Discussions

To facilitate the development of satisfactory study plans and eventually a satisfactory IS / EA Report, MFFN previously submitted draft study plans in an effort to hold technical discussions with the Agency, the MECP and other applicable agencies. A summary of technical discussions and correspondence held to date on this Study Plan has been provided in **Table 3-1** below.

Table 3-1: Study Plan Technical Discussions

Attendees . Responsible Party	Correspondence	Discussion Point(s)	Solution
■ **The Agency**	■ Comments received following the submission and review of draft Study Plan,	■ **10-July-2020:** Comments and clarification questions received, including editorial comments, additional information requirements regarding Study Plan, assessment and desktop analysis.	■ Additional details and clarification provided within the Study Plan, and responses to these comments are attached in **Appendix B**.
■ **MECP**	■ Comments received following the submission and review of draft Study Plan	■ **23-July-2020:** Comment and technical discussion pertaining to the collection and use of existing data, previous studies and desktop analysis to inform baseline conditions and Study Plan.	■ Additional details and clarification provided within the Study Plan, and responses to these comments are attached in **Appendix B**.
■ **MECP** ■ **MNRF** ■ **Ministry of Energy, Northern Development and Mines (ENDM)** ■ **The Agency** ■ **ECCC** ■ **MFFN CAR Project Team**	■ Technical discussion related to comments received following agency review of the draft Study Plan	■ **11-September 2020:** Comment and technical discussion pertaining to the collection and use of existing data, previous studies and desktop analysis to inform baseline conditions and Study Plan.	■ More details of the previous studies and existing information that were used to steer and inform this Study Plan have been included.
■ **MECP** ■ **ENDM** ■ **The Agency** ■ **ECCC** ■ **Canadian Wildlife Services** ■ **MFFN CAR Project Team**	■ Technical discussion of Wolverine study design. Follow-up comments received regarding Wolverine study design on March 10, 2021	■ **23-February-2021:** Comment and technical discussion pertaining to the Wolverine study design.	■ Additional details and clarification on the Wolverine study design have been included in this Study Plan,

4. IS / EA Report Consultation and Engagement Process

4.1 Interested Persons and Government Agencies

The Proponent will provide Project notices and advise of opportunities for consultation and engagement with interested persons[7] which includes, at a minimum, members of the public outlined in the *Public Participation Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020b) (referred to as the Public Participation Plan). This will include the opportunity to provide input on the existing environment, VCs, effects assessment methods, effects assessment results, and mitigation and follow-up program measures as applicable. A variety of activities will be offered so that members of the public are informed of the IS / EA Report as it progresses and are aware of the opportunities and means to provide their input. The study plans have recognized public and agency input received on the Project to date. Government agencies and interested persons will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process. The Project's approach to handling confidential and sensitive information is outlined in **Section 2.1**.

4.2 Indigenous Communities

The Proponent will provide Project notices and opportunities for consultation and engagement with Indigenous communities identified in **Table 4-1**, which is inclusive of all Indigenous communities identified in the *Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment* (the Agency 2020c) (referred to as the Indigenous Engagement and Partnership Plan).

Indigenous communities will be provided the opportunity to be involved at critical decision-making points throughout the IS / EA Report so that the Proponent can consider and incorporate, where appropriate Indigenous Knowledge and Indigenous land and resource use information into the Project as it pertains to the existing environment, VCs, effects assessment methods, effects assessment results, and mitigation and follow-up program measures. A variety of activities will be offered so that Indigenous communities are informed of the IS / EA Report as it progresses and are aware of the opportunities, means and timelines to

7. *Interested persons, as defined in the IS / EA Consultation Plan, are individuals and groups (e.g., associations, non-governmental organizations, industry and academia) who could have an interest in the Project, including but not limited to communities in the region, those with commercial interests (e.g., forestry, trappers, outfitters, other mineral tenure holders in the area) and recreational users or those with recreational interest (e.g., campers, hunters and environmental groups).*

provide their input. The study plans have recognized Indigenous community input received on the Project to date. Indigenous communities will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process.

Table 4-1: Identified Neighbouring Indigenous Communities, including their Provincial Territorial Organizations and / or Tribal Council Affiliations

Tribal Council Affiliation	Indigenous Community or Organization
Matawa First Nations Management *(Nishnawbe Aski Nation)*	■ **Marten Falls First Nation** (Proponent and potentially affected Indigenous community) ■ Aroland First Nation ■ Constance Lake First Nation ■ Eabametoong First Nation ■ Ginoogaming First Nation ■ Neskantaga First Nation ■ Nibinamik First Nation ■ Webequie First Nation
Matawa First Nations Management and the Union of Ontario Indians / Nishnawbe Aski Nation	■ Long Lake #58 First Nation**
Mushkegowuk Council *(Nishnawbe Aski Nation)*	■ Attawapiskat First Nation ■ Fort Albany First Nation ■ Kashechewan First Nation
Shibogama First Nations Council *(Nishnawbe Aski Nation)*	■ Kasabonika Lake First Nation ■ Kingfisher Lake First Nation ■ Wapekeka First Nation ■ Wawakapewin First Nation ■ Wunnumin Lake First Nation
Independent First Nations Alliance *(Nishnawbe Aski Nation)*	■ Kitchenuhmaykoosib Inninuwug First Nation
Independent First Nations *(Nishnawbe Aski Nation)*	■ Mishkeegogamang First Nation ■ Weenusk First Nation
Nokiiwin Tribal Council	■ Animbiigoo Zaagi'igan Anishinaabek First Nation*
Métis Nation of Ontario	■ Métis Nation of Ontario; Region 2*
Independent Métis Nation	■ Red Sky Independent Métis Nation*

*Notes: * Indigenous communities or organizations identified by the MECP who should be consulted on the basis that they may be interested in the Community Access Road.*
*** The MECP indicated in a letter to MFFN that Long Lake #58 First Nation was moved from interest-based to rights-based.*

4.3 Consideration of Identity and Gender-Based Analysis Plus in Engagement

To fulfill requirements of the IAA, the Consultation and Engagement Program will consider a diverse range of perspectives from interested persons and interested Indigenous communities and their members identified in the Agency's Indigenous Engagement and Partnership Plan and the Public Participation Plan. This will include at a minimum providing ongoing opportunities for engagement to:

- **Neighbouring Indigenous communities, including relevant subpopulations:**
  - Women;
  - Youth; and
  - Elders.
- **Non-Indigenous communities including:**
  - Women;
  - Youth; and
  - Activity-based subgroups (e.g., recreationalists, snowmobilers, tourism establishment operators).

The Proponent will also consult and engage with other subpopulations identified by communities during consultation and engagement. The information from these activities and any additional identity groups identified by communities through consultation and engagement will be considered by applicable environmental disciplines for the purposes of data collection and considering disproportionate effects.

During consultation and engagement, these aforementioned groups will be consulted and engaged with on targeted input**.** Specialized knowledge will be gathered through other disciplines such as Social, Economic, Land and Resource Use and Aboriginal and Treaty Rights and Interests. The Socio-economic Data Collection Program is expected to include targeted interviews, focus groups, questionnaires and other niche tools to gather information from diverse populations to resolve gaps in socio-economic secondary data. These diverse populations include the aforementioned identity groups, which are also referenced in the IS / EA Consultation Plan, and those identified by communities during consultation and engagement. The importance of soliciting inputs and perspectives from diverse subgroups has also been factored into the Indigenous Knowledge Program and associated materials (see **Section 5**).

When feedback is received from interested persons and Indigenous communities, issues, comments and questions will be tracked, which is consistent with the process described in the IS / EA Consultation Plan. Specific to Gender-Based Analysis Plus objectives, this will include efforts to engage with diverse populations. It is expected this will include activities specific to subgroups and tabulation of consultation and engagement participation with respect to identity factors. This will provide summary statistics to demonstrate the diversity achieved in consultation and engagement.

5. Consideration of Indigenous Knowledge in the IS / EA Report

The following provides a general description of how Indigenous Knowledge will be considered in the IA / EA process. The extent to which Indigenous Knowledge is considered by each specific VC will vary depending on the nature of the VC, the potential for Project effects on the VC and whether Indigenous knowledge that relates to a VC is provided / obtained. As such, not all aspects of the general approach described below may apply to all VCs / study plans.

There are two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program. Both programs serve to support the collection of Indigenous perspectives, values, and input on the Project, including Aboriginal and Treaty Rights and how they may be impacted by the Project, to be integrated throughout the IA / EA process. However, the Indigenous Knowledge Program specifically aims to solicit and incorporate information that is considered sensitive and may have confidentiality requirements, including Indigenous Knowledge and information on Indigenous land and resource use. Indigenous Knowledge Sharing Agreements will be established between the Proponent and Indigenous communities participating in the Indigenous Knowledge Program prior to the sharing and use of any sensitive information.

All Indigenous communities and groups identified by the MECP and the Agency through the Indigenous Engagement and Partnership Plan have the opportunity to participate in the Indigenous Knowledge Program. The Indigenous Knowledge Program provides interested Indigenous communities an opportunity to share existing Indigenous Knowledge and information on Indigenous land and resource use and cultural values that may be relevant to the Project, and / or complete Project-specific studies to collect and share Indigenous Knowledge and information on Indigenous land and resource use and cultural values. The Indigenous Knowledge Program includes opportunities for Indigenous communities and groups to meet with the Proponent to discuss the program, ask questions, and share concerns and interests. In support of this, the Proponent has created an Indigenous Knowledge Program Guidance Document (the Guidance Document) that provides:

- An overview of the Indigenous Knowledge Program and information on how Indigenous Knowledge, Indigenous land and resource use, and cultural values and practices can be collected and / or shared;

- Information on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values and practices may be used in the planning and design processes; and
- A suite of guidance materials that were developed based on the information requirements of both the federal and provincial assessment processes, including: question guides to support the collection of information on historical and current community context; Indigenous Knowledge that may be relevant to the various technical disciplines; information on Indigenous land and resource use, cultural values and practices and associated spatial data, and perspective on potential Project-related effects and associated mitigation and/or enhancement measures.

The Guidance Document will also support participating Indigenous communities in providing Project-specific information in a manner that facilitates meaningful incorporation into the IS / EA Report.

The IS / EA Consultation Plan outlines the process for obtaining information and feedback about the Project from Indigenous communities (i.e., the Consultation and Engagement Program). All Indigenous communities identified by the MECP and the Agency have the opportunity to participate in the Consultation and Engagement Program through community-specific meetings, Public Information Centres, web conferences, and other formats. All Indigenous communities identified by the MECP and the Agency will be provided information related to the Project and invited to participate at various points throughout the IA / EA process.

There are also opportunities for technical teams to engage with Indigenous communities to solicit perspectives and information relevant to the Project, including information related to collection of existing information and the development of the IS / EA Report. The Proponent also invites feedback and inputs throughout the Project via the Project website and ongoing communications with the Proponent.

The Indigenous Knowledge and Consultation and Engagement programs are designed to be complementary and provide multiple opportunities for communities to offer feedback and information, including perspectives on Aboriginal and Treaty Rights and interests and how these may be impacted by the proposed Project. Relevant information collected through both the Indigenous Knowledge and Consultation and Engagement programs, including potential effect pathways on Aboriginal and Treaty Rights and interests, will be shared with each of the relevant disciplines throughout the IA / EA to: guide and inform VCs; support characterization of the existing environment; identify the potential effects of the Project on VCs; help identify mitigation measures and potential monitoring programs; and ultimately guide Project planning. The nature of how the Indigenous Knowledge becomes integrated into the IS / EA Report will be dictated by the specific information provided by each Indigenous community and the parameters set out in

the Indigenous Knowledge Sharing Agreements. A description of how Indigenous Knowledge was considered in the IA / EA and in each of the technical discipline areas will be included in the IS / EA Report.

It is also important to note that information collected through the various activities (e.g., field studies and programs, effects assessments) of each discipline area (e.g., wildlife, vegetation, cultural heritage) will be shared with the Indigenous Knowledge Program leads. This will support the establishment of the existing environment and the effects assessment for the Aboriginal and Treaty Rights and Interests environmental discipline, as well as the identification of potential mitigation measures and monitoring programs, given the interrelated nature of Indigenous peoples and other environmental disciplines.

The Proponent will strive to respectfully collaborate with Indigenous communities on how Indigenous Knowledge and information on Indigenous land and resource use and cultural values will become part of the IS / EA Report, and how potential effects to Aboriginal and Treaty Rights and interests will be assessed. It is expected that measures to support this may include but are not limited to: engaging Indigenous communities to solicit information on Indigenous Knowledge and Indigenous land and resource use and cultural values to inform baseline conditions, providing Indigenous communities with draft sections of the IS / EA Report to illustrate how Indigenous Knowledge and information on Indigenous land and resource use and cultural values has been integrated and to confirm it has been presented appropriately, and completing collaborative working sessions with Indigenous communities for the effects assessment on Aboriginal and Treaty Rights and Interests. Further information on how potential effects on Aboriginal and Treaty Rights will be assessed is provided in the Aboriginal and Treaty Rights and Interests Study Plan.

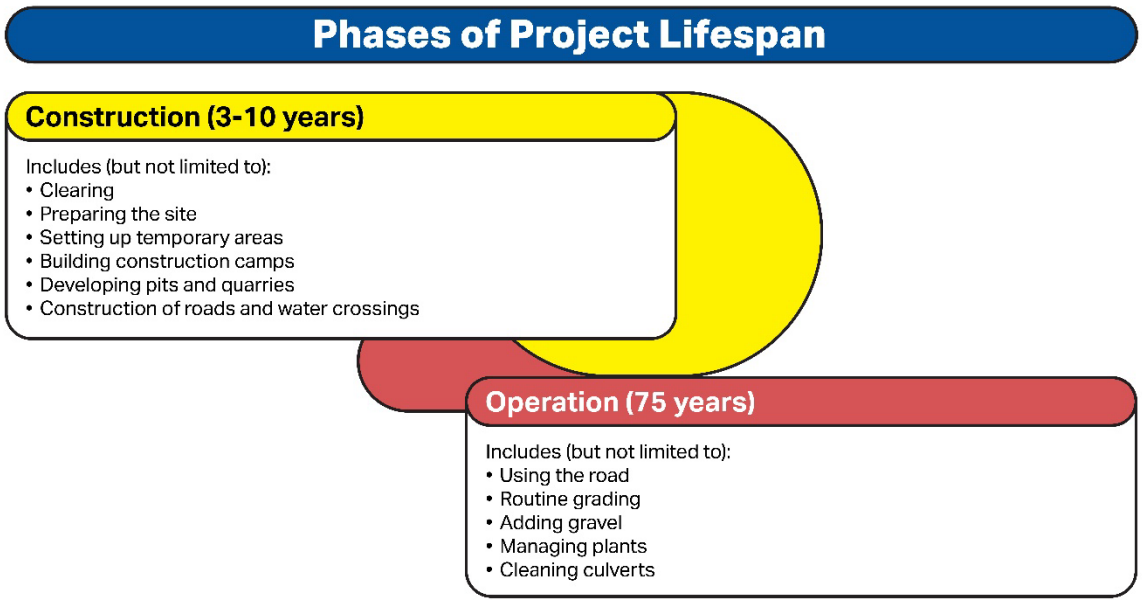
6. Assessment Boundaries

6.1 Temporal Boundaries: Project Phases

Project phases, which are temporal boundaries, are developed to establish the timeframes within which potential effects of the Project will be considered in the IS / EA Report. The Project is planned to occur in two phases, which are briefly described below and shown in **Figure 6-1**.

- **Construction Phase:**
  The time from start of construction, including site preparation activities, to the start of operations and maintenance of the CAR. Decommissioning of construction works is included in the construction phase. The construction phase is anticipated to take approximately 3 to 10 years to complete.
- **Operations and Maintenance Phase:**
  The operations and maintenance phase starts once construction activities are complete and lasts for the life of the Project. The operations and maintenance phase of the Project is considered to be 75 years based on the expected timeline for when major refurbishment of road components (e.g., bridges), is anticipated.

Figure 6-1: Project Schedule



There are currently no plans to decommission the CAR as there is no expected / known end date for its need. Therefore, future suspension, decommissioning and eventual abandonment of the CAR will not be considered in the IS / EA Report. It will be considered if and when a decommissioning or abandonment application is made for the road.

In determining the temporal boundaries, in particular the long operations and maintenance phase, consideration was given to the long-term effects on the well-being of present and future generations (Sustainability Principle #2[8]). The final temporal boundaries to be used in the IS / EA Report will be based on regulatory agency guidance, professional judgement and input received through the Project consultation process.

6.2 Spatial Boundaries: Study Areas

6.2.1 General Information

Study areas identify the geographic extents within which potential effects of the Project are likely to occur and will be considered in the IS / EA Report. The existing conditions and potential effects are documented for three study areas selected for the Project:

- **PDA:** area of direct disturbance;
- **LSA:** the area where direct effects of the Project are likely to occur; and
- **RSA:** the area where indirect effects of the Project are likely to occur.

The PDA encompasses the 100 metre (m) wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, pits, quarries and associated access roads. The preliminary LSA currently being considered within the scope of the ongoing provincial regulatory review process generally includes the area within 2.5 km of the centreline of Alternative 1 and Alternative 4. The preliminary study area generally allows for the documentation of existing conditions and prediction of potential environmental effects for the Project. A 5 km wide study area also allows for route refinements during development of Project design (e.g., adjustment of the alignment to avoid sensitive features).

The specific location of Project components, including the roadway, quarries, pits and temporary infrastructure, are not yet known and will be included in the IS / EA Report. While most of the Project

8. *Sustainability Principles #2 is one of four sustainability principles included in Section 25 of the Project's TISG as further elaborated on Section 9.8.*

components are expected to be located within the preliminary 5 km wide study area, benefits (e.g., reduced environmental disturbance, avoidance of sensitive features, technical considerations, concerns received through consultation) for locating Project components on lands outside of the 5 km wide study area may become known during the IA / EA process. If the need to locate Project components outside the 5 km wide study area is determined to be required or of benefit to the Project, the study area would be adjusted.

The study area for each environmental discipline may vary from the above-described general study area based on the potential for the Project to directly or indirectly affect each environmental discipline; therefore, discipline-specific LSAs and RSAs have been defined for the Project. In defining the final LSAs and RSAs, each environmental discipline will consider:

- Location and other characteristics of the environmental discipline relative to the Project;
- The anticipated extent of the potential Project effects;
- Federal, provincial, regional, and local government administrative boundaries;
- Indigenous groups listed in **Table 4-1**;
- Community knowledge and Indigenous Knowledge;
- Current or traditional land and resource use by Indigenous communities;
- Exercise of Aboriginal and Treaty Rights of Indigenous peoples, including cultural and spiritual practices; and
- Physical, ecological, technical, social, health, economic and cultural considerations.

The study areas included in this document are preliminary, covering the extent to which readily available information suggests the Project may have noticeable effects on the environment. The size, nature and location of past, present and reasonably foreseeable projects will be taken into consideration in the development of the cumulative effects assessment study area(s). The appropriate study area(s) to assess cumulative effects are dependent on the VCs predicted to have direct residual adverse effects as a result of the Project, and therefore, cannot be defined until the IS / EA Report has sufficiently advanced.

6.2.2 Wildlife Study Areas

For the Wildlife VCs, spatial boundaries were defined using an ecosystem-centred approach for the LSA and RSA, as certain ecological features are more likely to be affected than others. The LSA was defined to consider the range of land cover types in its spatial extent, the spatial distribution of these land cover types, and the rate of change in land cover composition with increasing distance from the PDA.

LSA boundaries for the Wildlife VCs were defined following the methods outlined in Section 7.4.1 of the TISG (the Agency 2020a). Land cover within the limits of the PDA was first calculated using the Ontario Far North Land Cover (MNRF 2014a) dataset. Buffers were applied to the limits of the PDA in increments of 100 m, continuing to 15 km, and the percentage of each of the major land cover types within each increment was calculated. The rate of change between successive buffers was then calculated in order to determine the maximum calculated rate of change across all buffer increments. The first buffer increment was calculated using the percent difference between the PDA and that buffer increment (100 m). Once the maximum calculated rate of change for each land cover type was calculated, the LSA boundary was defined as the buffer width that was the maximum of:

- 500 m from the PDA boundary, or
- the buffer increment where
  - All major land cover types have a rate of change in land cover composition of less than or equal to 5% of the maximum rate of change, and
  - The increment is beyond (i.e., further away from the PDA) where the maximum rate of change is found.

Using the methods outlined above it was found that the LSA boundary should extend to 2.8 km from the limits of the PDA. We have rounded the LSA to 3 km on either side of centreline to capture the 100 m PDA and include a whole number. This LSA includes the TISG suggested minimum 1-km buffer for bats and exceeds setback buffers of possible reptile, amphibian, mammal, and insect species in the study areas (the Agency 2020a; Environment Canada 2009). A Wolverine-specific LSA extends 10 km beyond the PDA as per the TISG (the Agency 2020a) due to the low density of this species estimated at 0.7 per 1,000 km^2 in the study areas (Dawson *et al.*, unpublished data 2004 and 2013 in COSEWIC 2014).

A similar approach was taken to define the boundary of the RSA using the calculated percent cover within the LSA (3 km) as a starting point. Percentages of each land cover type were calculated in buffer increments of 100 m from the LSA to determine the rate of change between increments and identify the maximum rate of change for each land cover type between the LSA and 15 km. Doing so determined that the RSA boundary should extend 7.7 km from the limits of the LSA and 10.7 km from the limits of the PDA. As such we have included an RSA of 11 km from centreline for all wildlife with the exception of Wolverine, and also Caribou[9]. This approach is intended to:

- Lead to LSA boundaries that represent land cover types found within the PDA and RSA boundaries that represent the land cover that comprises both the PDA and LSA, especially rarer habitats;

9. *Refer to the Ungulate Study Plan.*

- Represent the rapid land cover change that occurs along the edges of these features; and
- Represent a portion of the broader landscape matrix (**Table 6-1**).

Table 6-1: Land Cover in the Study Areas

Study Area	Wolverine RSA[a]		RSA[b]		Wolverine LSA[c]		LSA[d]		PDA[e]	
Land Cover	**Area (ha)**	**% of Total Area**	**Area (ha)**	**% of Total Area**	**Area (ha)**	**% of Total Area**	**Area (ha)**	**% of Total Area**	**Area (ha)**	**% of Total Area**
Coniferous Treed	1,724,603.9	10.7	66,760.5	11.4	62,150.9	11.5	21,150.7	11.2	562.0	16.0
Coniferous / Thicket Swamp	2,405,906.4	14.9	157,263.0	26.8	146,180.1	26.9	51,019.3	26.4	1,021.3	29.1
Deciduous Treed	203,177.1	1.3	9,541.9	1.6	9,036.7	1.7	2,892.5	1.5	79.3	2.3
Disturbance - Non and Sparse Woody / 2012 Fire	442,293.2	2.7	45,810.7	7.8	41,386.6	7.6	16,313.1	8.4	374.1	10.6
Disturbance - Treed and / or Shrub / Sparse Treed	860,584.7	5.3	34,663.4	5.9	32,418.7	6.0	14,136.0	7.3	340.5	9.7
Mixed Treed	455,598.7	2.8	22,767.1	3.9	21,294.0	3.9	7,387.6	3.8	188.3	5.4
Treed / Open Bog	4,118,641.5	25.5	108,446.0	18.5	99,887.4	18.4	34,159.5	17.8	351.9	10.0
Treed / Open Fen	4,164,940.2	25.8	107,498.7	18.3	97,973.5	18.1	35,251.0	18.3	549.0	15.6
Total	**13,933,452.5**	**89.0[a]**	**552,751.3**	**94.1[b]**	**510,327.9**	**94.0[c]**	**182,309.7**	**94.7[d]**	**3,466.4**	**98.7[e]**

Notes: The balance of cover types not included in the above table are as follows:

a. Bedrock, Clear Open Water, Community Infrastructure, Deciduous Swamp, Heath, Freshwater Marsh, Supertidal Marsh, Intertidal Marsh, Intertidal Mudflat, Sand / Gravel / Mine Tailings and Other account for ≤ 0.1% (Turbid Water accounts for 0.2%)
Clear Open Water accounts for 10.5%

b. Freshwater, Marsh, Bedrock, Turbid Water and Community / Infrastructure account for less than 0.1%
Clear Open Water accounts for 5.9%
0.5% of the RSA is not covered by the Far North Land Cover dataset

c. Freshwater, Marsh, Bedrock, Turbid Water and Community / Infrastructure account for less than 0.1%
Clear Open Water accounts for 5.5%

e. Freshwater, Marsh, Bedrock, Turbid Water and Community / Infrastructure account for less than 0.1%
Clear Open Water accounts for 5.3%

f. Bedrock accounts for 0.1%
Clear Open Water accounts for 1.4%

For Wolverine, the RSA includes all Wildlife Management Units (WMU) that intercept the Wolverine LSA which includes WMUs 17, 18 and 1D. This approach will allow for assessment of indirect effects of the Project on individuals comprising the population of potentially affected Wolverine in the Northern Ontario and Hudson Bay Lowlands Ecozones. Due to the size and distribution of WMUs 17, 18 and 1D, land cover within the Wolverine RSA has a higher representation of land cover types found within the Hudson Bay Lowlands compared to the PDA.

As further detailed in **Section 4**, the Proponent will continue to provide opportunities for neighbouring Indigenous communities and interested persons to provide input and inform the effects assessment, including the LSAs and RSAs.

The LSA and RSA boundaries for Wildlife are detailed in **Table 6-2** and shown on **Figure 6-2** and **Figure 6-3**.

Table 6-2: Wildlife Study Areas

Study Area	Geographic Extent	Rationale
LSA	■ 3 km buffer from centreline for all Wildlife. See **Figure 6-2**.	■ Area where direct effects of the Project are likely to occur. Considers the range of land cover types in its spatial extent, the spatial distribution of these land cover types, and the rate of change in land cover composition with increasing distance from the PDA.
LSA (Wolverine)	■ 10 km buffer from centreline. See **Figure 6-3**.	■ Wolverine have a relatively large home range and therefore require a larger LSA to accurately capture all direct effects associated with the Project.
RSA	■ 11 km buffer from centreline. See **Figure 6-2**.	■ Using a boundary of 11 km will allow for assessment of indirect effects of the Project on the broader landscape, while remaining representative of the types of habitats found within the Project Area.
RSA (Wolverine)	■ All WMUs that intercept the Wolverine LSA. See **Figure 6-3**.	■ Using WMUs that overlap the Wolverine LSA will allow for assessment of indirect effects of the Project on individuals comprising the population of potentially affected Wolverine in the Northern Ontario and Hudson Bay Lowlands Ecozones.

Figure 6-2: Wildlife Local and Regional Study Areas

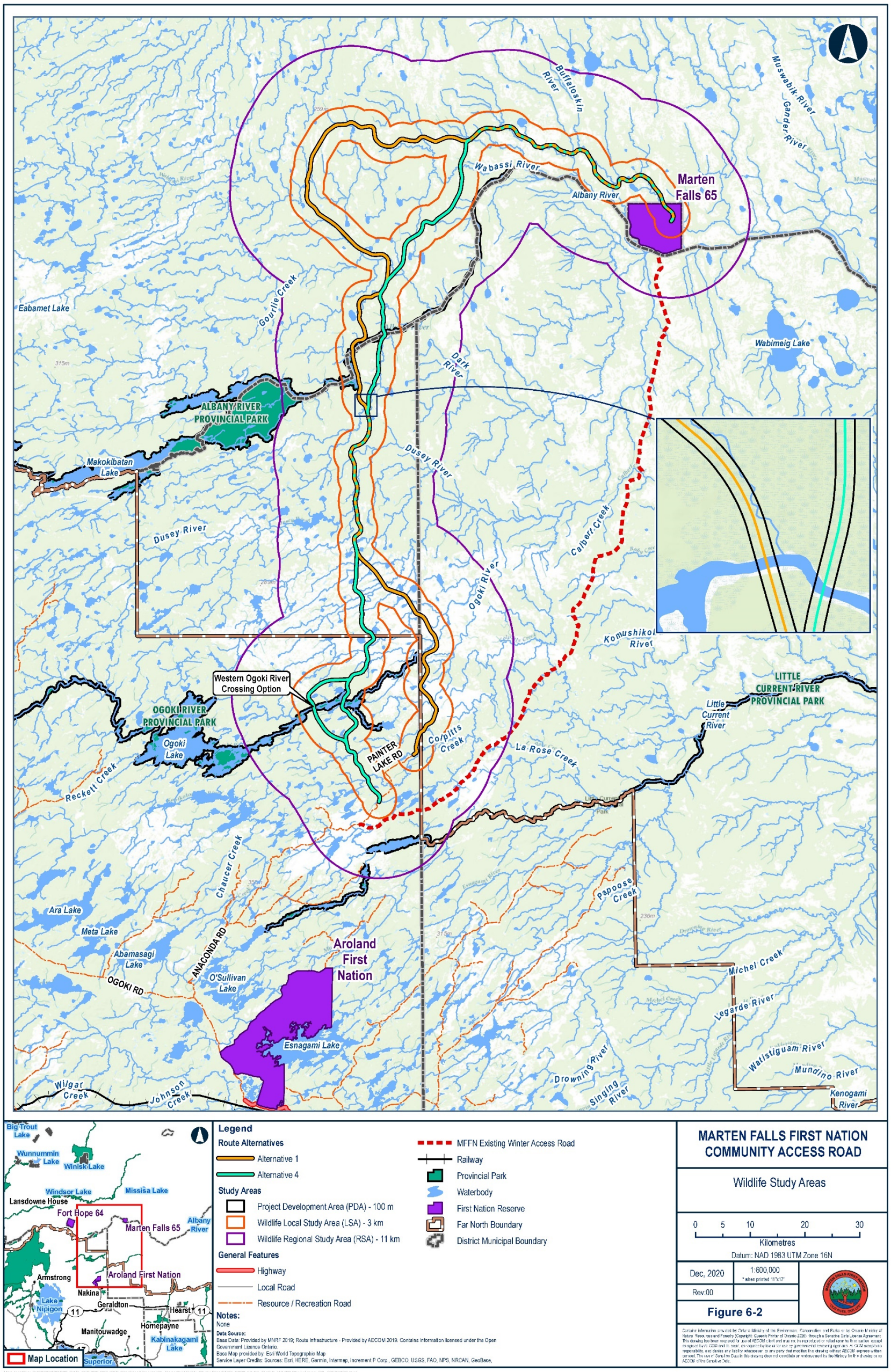
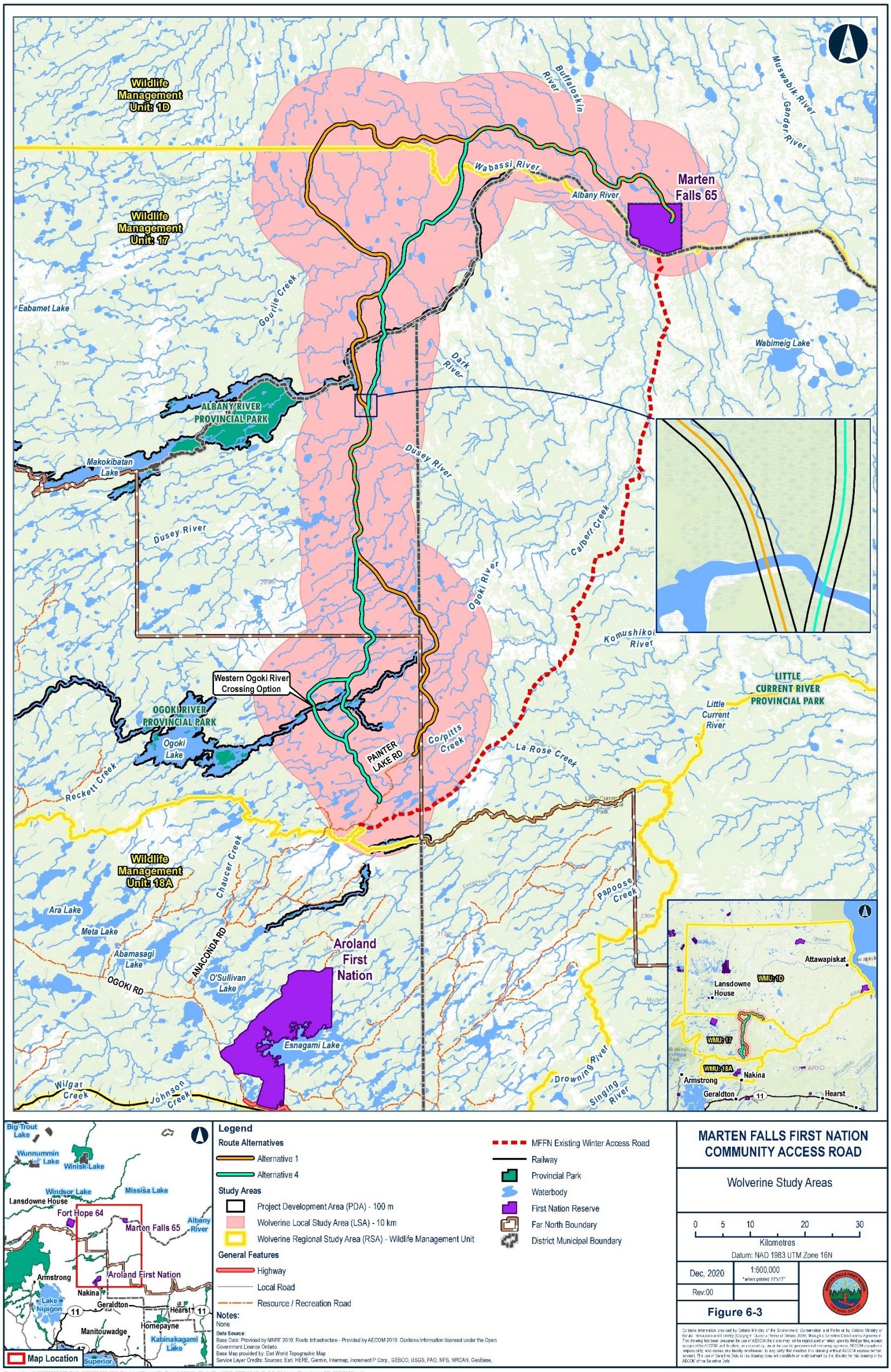


Figure 6-3: Wolverine Local and Regional Study Areas



7. Baseline Study Design

7.1 Desktop Assessment

A desktop review of existing information sources for bats, amphibians, reptiles, fur bearers, and pollinating insects will be completed to identify information gaps that will need to be addressed through further study. A preliminary list of applicable information sources has been included in **Appendix A** and reflects federal and provincial guidance received to date. Data sources are relevant in spatial and temporal coverage to the Project and are suitable as baseline information for northern areas where there are no roads. This Study Plan focuses on the additional studies that are anticipated to be required to gather information beyond what is currently available through existing information sources, including those as described in Section 7.2 'Sources of baseline information' in the Agency's TISG for this Project (the Agency 2020a).

7.2 Study Methods

The following study methods have been designed to address elements of the TISG required for field investigations (the Agency 2020a). This includes implementing best practices, incorporating Indigenous Knowledge and developing survey protocols that may be identified for critical habitats under the Schedule of Studies as outlined in various SAR recovery strategies that exist for species protected under SARA (Environment Canada 2015; Environment Canada 2016), provincial recovery strategies (Ontario Wolverine Recovery Team 2013; Humphrey and Fotherby 2019), government response statements (MECP 2020; MNRF 2016), and general habitat descriptions as they become available.

7.2.1 Bats

The Bat VC includes both migratory and non-migratory bats, three of these species are listed as "Endangered" under the SARA and ESA: Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*). Little Brown Myotis and Northern Myotis are known to have roosting habitat within the Wildlife RSA (iNaturalist Network 2020). Although the distribution and northern range limit of the tri-colored bat is not well understood, an acoustic study conducted as part of the Far North Biodiversity Project (FNBP) indicted that the range of this species may include the Wildlife RSA (Layng *et al.* 2019). More study is needed to confirm the distribution of this species and the northern extent of its range.

A combination of a desktop review and field surveys will be used to determine bat species presence, abundance, and distribution among seasons (summer breeding, spring and fall migration, overwintering), and among years. A desktop review will be conducted to describe SAR bat abundance and distribution. Determining bat abundance through field surveys will only be possible if counts can be conducted at maternity roosts or hibernacula. Other field methods to determine bat abundance have limitations. For instance, mobile transects are not possible due to the lack of roads in the LSA and mist-netting may be detrimental to SAR bats because of the risk of spreading the fungus that causes White-nose Syndrome (*Pseduogymnoascus destructans*) (Loeb *et al*. 2015).

An initial desktop review and one year of field surveys were completed by the MFFN CAR Project Consultant (2019) with descriptions and sample sizes provided in the following sections. Additional field surveys are also planned and described below.

7.2.1.1 Desktop Review

The MFFN CAR Project Consultant conducted a desktop review in 2019 to inform the locations of the field investigations targeting high-potential habitat for bat SAR including maternity roosts, foraging areas and hibernacula in the LSA. The following documents were followed when identifying suitable habitat:

- NHIC database (MNRF 2019a)
- Critical habitat as described in federal SAR recovery strategies (Environment Canada 2015) and provincial recovery strategies (Humphrey and Fotherby 2019)
- SARO List (MNRF 2019b)
- Bat Conservation International – Species Profile and Range Map for Big Brown Bat (*Eptesicus fuscus*), Eastern Red Bat (*Lasiurus borealis*), Eastern Small-footed Myotis (*Myotis leibii*), Hoary Bat (*Lasiurus cinereus*), Little Brown Myotis, Northern Myotis, Silver-haired Bat (*Lasionycteris noctivagans*), and Tri-colored Bat (BCI 2019)
- Atlas of Mammals of Ontario (Dobbyn 1994)
- Abandoned Mines Information System database (ENDM 2019)
- Bats and Bat Habitats: Guidelines for Wind Power Projects (MNRF 2011)
- Significant Wildlife Habitat Technical Guide (MNRF 2000)
- Draft Technical Note SAR Bats (MNRF 2015a)

Potential maternity roosting structures within the LSA were identified through a desktop habitat suitability exercise using the criteria outlined in the above guidance documents (Golder 2019). This exercise used

landcover base mapping and aerial imagery to predict the location of suitable SAR bat maternity roosting habitat. High potential maternity roosting habitat included deciduous and mixedwood forests with larger diameter trees (Golder 2019). Results indicated that the most suitable maternity roosting habitat exists in large diameter trees found in upland mixedwood habitat surrounding levees of large rivers, particularly the Ogoki and Albany rivers (Golder 2019).

To address the TISG requirement to compare all habitats used by SAR bats, other forest types will be examined for similar attributes (the Agency 2020a). Additional information will be provided by extrapolating the bat species distribution and habitat association models from Layng *et al.* (2019) to the LSA.

Potential hibernacula within the LSA were identified through a review of the Abandoned Mines Information System database (ENDM 2019) and consultation with the MECP (Golder 2019). A protocol for bat migration surveys is not currently described in Ontario's guidance documents and migration surveys are not common in scientific literature. In the absence of a protocol or other guidance, bat migration field surveys (if conducted) would likely not be effective at identifying migratory corridors. Given that the study areas are intersected by abundant watercourses which may be used as travel corridors, potential migration or travel and movement corridors (e.g., continuously treed river or stream valley, ridge-tops, treelines; Lausen *et al.* 2010, Government of Alberta 2013) will be identified through desktop review of aerial imagery and surficial geology (KGS Group 2019).

7.2.1.2 Field Surveys

7.2.1.2.1 Maternity Roost Habitat Survey

Using a combination of landcover mapping and aerial imagery, preliminary suitable maternity roost locations will be identified through a desktop exercise prior to being assessed in the field using the resources listed in **Section 7.2.1.1**. At maternity roost habitat survey locations (identified within the LSA based on desktop information), a snag density survey will be conducted of trees measuring at least 10 cm diameter-at-breast height. Three plots will be surveyed following provincial guidelines in each polygon subset to calculate the density and distribution of snag habitats. For the IA / EA, results will be extrapolated across the study areas as described in **Section 9** and used to assess effects of the Project on bats and bat habitat.

Additionally, Visual Checks are proposed as described in the Vegetation Study Plan to confirm suitable tree composition by helicopter and to confirm desktop delineation of suitable habitats.

No snag density surveys have been conducted for the Project to date. Information regarding timing and survey locations for future work will be provided at a later date.

7.2.1.2.2 Acoustic Surveys

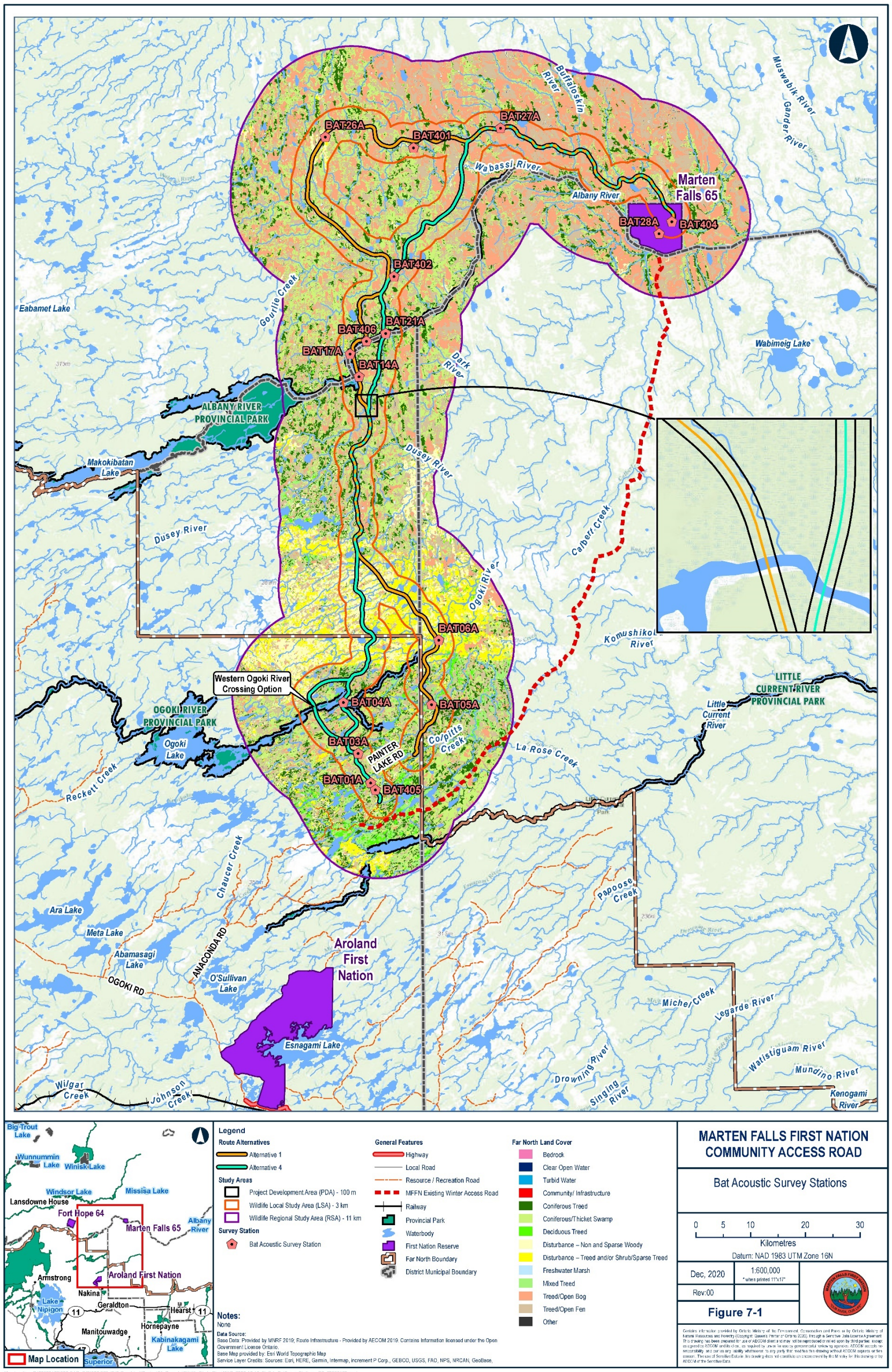
Golder's desktop review informed the general location of target candidate maternity roosts in deciduous and mixedwood forests as outlined in MNRF (2011). A bat expert oversaw the study design process as per the TISG and adjusted the target candidate maternity roost survey site locations to be in proximity to foraging habitat in open areas and travel corridors (the Agency 2020a). Golder (2019) established 17 bat acoustic survey stations in target candidate maternity roost habitat that were in operation from June 13-17 to September 2-4, 2019 (**Figure 7-1**). Results of the acoustic surveys will be provided in a separate baseline report.

An additional year of acoustic data collection is planned at the same survey stations as those visited in 2019, pending accessibility, to improve the understanding of natural variability in bat relative abundance within and among seasons and years in the PDA and LSA. Further information regarding timing and survey locations for future work will be provided at a later date.

No candidate hibernacula sites were identified following a desktop review of the Abandoned Mines Information System database, consultation with the MECP, and an aerial reconnaissance in 2019 to search for evidence of existing buildings or natural bedrock features (e.g., caves, crevices) (Golder 2019); thus, no acoustic surveys were conducted during the swarming season for hibernacula. For future work, the aerial reconnaissance will be expanded to include the alternate Ogoki River crossing. If candidate habitat is discovered and is accessible, visual inspection will be conducted from the exterior of the feature using the methods outlined in the Protocol for Assessing Bat Use of Potential Hibernacula (PGC and USFWS 2012). If the feature meets any of the following criteria, it will no longer be considered as a candidate bat hibernaculum (PGC and USFWS 2012):

- There is one horizontal opening, less than 15 cm in diameter, and no or very little airflow is detected;
- The opening is a vertical shaft less than 0.3 m in diameter;
- The passage terminates at a distance for which the observer can clearly ascertain by visual inspection from the opening that there are no fissures that bats can access;
- The opening / feature is prone to flooding, collapsed shut and completely sealed, or otherwise inaccessible to bats; and
- It is a "new" opening, which has formed recently (less than 1 year old) due to subsidence.

Figure 7-1: Bat Survey Stations 2019



If the feature appears to meet the criteria of a suitable hibernaculum according to the protocol (PGC and USFWS 2012), acoustic monitoring will be conducted at the sites. Further information regarding timing and survey locations for future work will be provided at a later date.

7.2.1.2.3 Data Collection

The 2019 acoustic surveys targeted for maternity roosting structures were conducted using Wildlife Acoustics Song Meter SM4BAT-FS ultrasonic recorders. Autonomous Recording Units (ARU)s were programmed to record ultrasonic activity nightly, beginning 30 minutes before sunset to 30 minutes after sunrise, for at least 10 days during the maternity roosting period of June 1 to June 30 (**Table 7-1**).

Table 7-1: Sampling Effort per ARU for Bats

Season	Survey Window	No. of Data Segments	Time of Survey
Maternity Roosting Period	■ June 1 – June 30	■ 10 nights	■ One half hour before sunset to one half hour after sunrise
Swarming Period (If potential hibernacula are identified)	■ August 1 – September 30	■ 6 to 8 weeks	■ One half hour before sunset for five hours

Where feasible, ARUs were placed within candidate bat maternity roost habitat, adjacent to open areas such as watercourses and wetlands where bat foraging activity was likely to be recorded. Microphones were positioned as high as possible, away from potential obstacles and angled away from prevailing winds. This placement improves recording quality by reducing surface echoes and ground noise caused by proximal vegetation, which can distort ultrasonic signals. The height and orientation of microphones installed at each station were documented. In order to compare survey results between multiple years; timing of surveys, equipment and setup protocols will remain consistent for the second survey year.

To be consistent with previous data collection protocols for future surveys each ARU will be fastened to trees at eye level, and the following details will be collected:

- detector make and model (Wildlife Acoustics Song Meter SM4BAT FS);
- microphone model used (SMM-U1);
- Universal Transverse Mercator (UTM) location of ARU;
- height of microphones;
- orientation of microphones;
- special housing that may affect microphone sensitivity (e.g., wind screen, cones, weatherproofing);

- mounting method;
- device specific settings (e.g., gain of 12 decibels);
- recording mode (i.e., full spectrum);
- directional orientation and surrounding habitat features; and
- photographs taken in each cardinal direction from the location of each ARU.

A summary of any issues with equipment failure, and a description of procedures used to assure equipment is operational during deployment (including ensuring microphone sensitivity remains within an acceptable range) will be reported.

In addition to maternity roost surveys, any candidate bat hibernacula features documented during the desktop review or aerial reconnaissance and visually assessed on the ground as having potential to support hibernating bats, will follow a similar procedure. The potential hibernacula will be searched to identify all possible entrances and ARUs will be installed within 10 m of all openings during the swarming period of August 1 to September 30. Surveys will occur on warm to mild nights (i.e., ambient temperature above approximately 10°C) with low winds (< 6 metres / second [m/s]) and no precipitation. For reference, monitoring will be conducted at known hibernacula, if possible and at activity control stations (i.e., near linear features that may be used as travel corridors). ARUs will be programmed to commence recording at dusk for five hours for six to eight weeks in order to capture the multiple swarming activity peaks that is indicative of a hibernaculum, and to avoid false positive detection that can occur when monitoring for a shorter period (**Table 7-1**). Visual monitoring is not planned due to safety concerns associated with working in remote locations and flying after dark.

Further information regarding timing and survey locations for future work will be provided at a later date.

7.2.2 Amphibians and Reptiles

The Amphibian VC includes 11 amphibians with potential to occur in the RSA based on known ranges (iNaturalist Network 2020; Ontario Nature 2020): American Toad (*Anaxyrus americanus*), Blue-spotted Salamander (*Ambystoma laterale*), Boreal Chorus Frog (*Pseudacris maculata*), Eastern Newt (*Notophthalmus viridescens*), Gray Tree Frog (*Hyla versicolor*), Green Frog (*Lithobates clamitans*), Mink Frog (*Lithobates septentrionalis*), Northern Leopard Frog (*Lithobates pipiens)*, Northern Two-lined Salamander (*Eurycea bislineata*), Spring Peeper (*Pseudacris crucifer*), and Wood Frog (*Lithobates sylvatica*). The auditory surveys listed below will provide a baseline of amphibian activity in the area.

The Reptile VC consists of the only confirmed reptile species found within the RSA, the Eastern Gartersnake (*Thamnophis sirtalis sirtalis*). However, given the limited information available for the region and known populations of Western Painted Turtle (*Chrysemys picta bellii*) and SOCC Snapping Turtle (*Chelydra serpentina*) these species may also have the potential to exist within the RSA. The LSA is situated in Ecoregions 2W and 2E, for which MNRF Significant Wildlife Criteria Schedules do not yet exist.

7.2.2.1 Amphibians

7.2.2.1.1 Amphibian Acoustic Surveys

Eight ARUs were deployed by Golder near wetland breeding habitats in 2019 to collect data on Eastern Whip-poor-will (*Antrostomus vociferus*) presence with a secondary objective of determining amphibian presence and distribution during the breeding season (**Figure 7-2**). Results of these surveys will be provided in a separate baseline report.

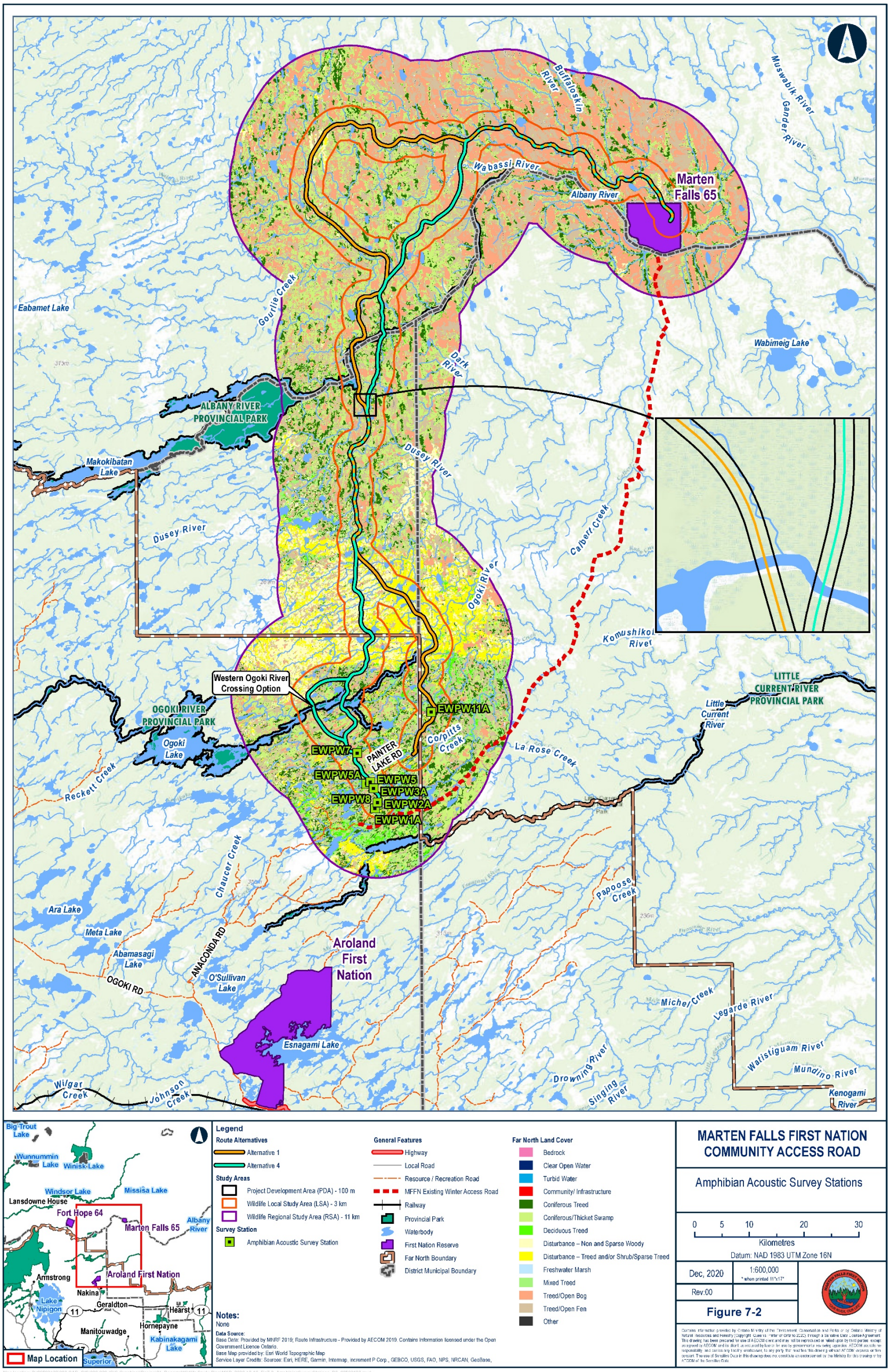
The objective of amphibian acoustic survey is to estimate the presence and distribution of amphibian species in the LSA among years. Amphibian survey stations will coincide with the bird ARU stations located near suitable amphibian breeding habitats (e.g., marshes, beaver ponds). The ARUs will be programmed to record at dusk during the appropriate timing windows recommended in the Marsh Monitoring Program-Amphibian Surveys (BSC 2009). A desktop review will be performed to identify the need for supplementary survey stations near wetlands in the LSA. Given that marsh habitat is rare in the LSA (< 0.1%), ARUs may be re-deployed at the same eight 2019 survey locations. These sites will be safely accessed by helicopter during the day and ARUs will be securely fastened to objects such as the largest available trees to prevent movement and obstruction of sound. Vegetation will be cleared from the area immediately around ARUs to prevent unwanted noise. Retrieval of ARUs will occur as required by the schedule for breeding birds and / or bats.

During the amphibian breeding season in the northern region from May 1 to July 15 (Bird Studies Canada 2009), Wildlife Acoustics SM3 or similar devices will record acoustic data for amphibian calls concurrently with the breeding birds recording schedule (starting 30-minutes after local sunset with a schedule of three-minutes ON and 12-minutes OFF until midnight) (**Table 7-2**) as described in the Bird Study Plan. Ideally, each night will be separated by at least 15 days with winds described as less than 4 on the Beaufort Wind Scale and air temperatures greater than 5°C for round one, 10°C for round two, and 17°C for round three (BSC *et al*. 2009).

Table 7-2: Sampling Effort per ARU for Amphibians

Season	Survey Window	No. of Data Segments	Segment Length	Time of Survey
Breeding	■ May 1 – July 15	■ 3	■ 3-minutes	■ One half hour after sunset to midnight
Non-breeding (incidental)	■ March 15 – April 30; July 16 – September 30	■ Variable depending on survey's sampling design	■ 1 to 3-minutes	■ Any time during the day

Figure 7-2: Amphibian Acoustic Survey Stations



Any amphibian observed (visual or auditory) incidentally while conducting other field surveys will be recorded for species, estimate of number of individuals, location, and a brief description of the habitat. Incidental amphibian observations will provide some additional information about seasonal distribution.

7.2.2.1.2 Habitat Surveys

Habitat within 100 m of the ARU site centroids will be documented with photographs as described in the TISG (the Agency 2020a) and classified by Ecological Land Classification (ELC) Ecosite or Canadian Wetland Classification Class as described in the Vegetation Study Plan for modelling purposes. Ecosite classification will be completed by qualified individuals to classify habitat following the MNRF Boreal Ecosites (Banton *et al.* 2009) and Canadian Wetland Classification System (National Wetlands Working Group [NWWG] 1997). Fire history of survey sites will be determined using the MNRF Far North Land Cover database (MNRF 2014a) and Ontario's Provincial Satellite Derived Disturbance Mapping digital resource (Government of Ontario 2020); whereas, elevation will be determined using the Provincial Digital Elevation Model (MNRF 2019), Light Detection and Ranging (LiDAR) and surficial geology through mapping developed by KGS Group (2019).

7.2.2.2 Reptiles

Incidental observations of reptiles encountered while conducting other surveys will be documented for the number of individuals, location, and habitat. If several individuals are encountered together, the possibility of snake hibernacula site will be noted, and a visual encounter survey will be conducted. Snapping Turtle records have not been recorded within the LSA, and it is not anticipated that they will be found. Therefore, targeted SAR surveys are not proposed for Snapping Turtle.

7.2.3 Fur Bearers

Fur bearers targeted for study based on the TISG (the Agency 2020a), ToR and consultations with Indigenous communities include American marten (*Martes americana*), beaver (*Castor canadensis*), black bear (*Ursus americanus*), fisher (*Pekania pennanti*), gray wolf (*Canis lupus*), mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), river otter (*Lontra canadensis*), snowshoe hare (*Lepus americanus*), and wolverine. American marten, beaver and wolverine will act as proxies to represent small and large fur bearers and will be examined more closely as part of the effects assessment. Wolverine is listed as Threatened under the ESA and Special Concern under the SARA. Any fur bearer that is likely to be directly or indirectly affected by the activities taking place within the LSAs will be identified.

A desktop review of harvest data was completed by Golder (2019) and preliminary field surveys were conducted during the summer of 2019 using motion sensitive cameras. A combination of IK information and desktop review for harvest record data as well as additional field surveys will be used to determine the seasonal distribution, abundance, population status, movements, and habitat requirements of American Marten, Beaver and Wolverine among years.

Upcoming field surveys include aerial tracking, winter tracking, motion sensitive camera tracking, and hair snag traps.

7.2.3.1 Beaver Lodge Aerial Surveys

Beaver lodges will be identified incidentally during systematic waterfowl / raptor aerial surveys to determine the distribution and abundance of Beavers in the LSA. To obtain multiple years of survey data, the 2019 incidental observations by Golder will be paired with aerial imagery interpretation of Beaver activity from LiDAR imagery gathered in 2019. Active Beaver lodges will be identified by a surveyor and pilot in a low-flying helicopter (100-500 m above ground) at 100 kilometres / hour (km/h) along transects between leaf-fall and freeze up since this period provides optimal visibility of feed piles on and near lodges (Payne 1981). To help to ensure correct classification of activity at lodges, the helicopter will circle all inactive lodges until the observer is certain there is no fresh activity. The primary criterion for an active lodge will be the presence of a fresh feed pile within 150 m of the lodge (Novak 1987). Other activities to locate and classify lodges include sightings of Beaver(s), maintained dams, high water levels in ponds, fresh cuttings, or fresh mud on a lodge (Popko and Veitch 1998).

7.2.3.2 Wolverine Aerial Tracking Surveys

Wolverines occur at extremely low densities so the probability of encountering their tracks is low. Wolverine tracks (if present) will be identified most effectively in the Wolverine LSA (10 km buffer) during Caribou winter aerial surveys and will be the primary survey method for Wolverine detection. The objective of the aerial surveys for Wolverine is to support determination of the distribution and abundance of this species in the Wolverine LSA. All tracks or sightings of Wolverine detected beyond the Wolverine LSA (> 10 km buffer) during Caribou aerial surveys will be classified as incidental observations.

Zoetica conducted aerial fixed-wing surveys in February 2018 over 12 days using a high-powered infrared device to detect ungulates and other large mammals (Golder 2019). Fifteen north-south transects spaced 10 km apart were flown, and wildlife observations and their tracks were documented. Results of this study will be provided in a separate baseline report. Information from this study helped inform the study design approach for Wolverine aerial tracking surveys.

Wolverine aerial surveys will be completed using the methods described in the MNRF's Ozhiski Caribou Aerial Survey, 2018: Operating Procedures and Background (MNRF 2018 draft) (referred to herein as the Ozhiski Protocol) which is a two-stage approach. The two-stages involve a fixed wing and a rotary wing survey. The pilot will be experienced with conducting low-level, low-speed ungulate surveys in Ontario.

Parallel transects on a northeast to southwest orientation will be flown through the centroids of a 10 km2 hexagonal grid by a fixed wing aircraft. Transects will be spaced approximately 2 km apart, and every fifth transect will extend to a larger area of potential impact (35 km buffer from the Project). Transects will be flown over a period of 5-10 days between early January and mid-March. Optimal flight times will be between 10 AM and 2 PM when flying over a densely forested landscape but can extend between 9 AM and 5 PM over lowlands. Ferrying time between Nakina (and / or another location) to transect start and end points will occur earlier or end later in the day.

Using the Avenza Maps app (Avenza Systems Inc.), running on an iPad wirelessly connected to a GPS, pre-established flight lines loaded onto a geospatial PDF map will be followed. Transects will be flown at a low altitude (100-200 metres above ground) and at slow speeds that are safe for the fixed wing aircraft and necessary for optimal search effort. The survey will be conducted during high-visibility weather conditions and 100% snow cover (ideally minimum 15 cm; MNRF 2018). The Ozhiski Protocol (MNRF 2018) will be used as guidance for crew responsibilities, data collection methods, double-observer protocol. The MFFN CAR Project Consultant and pilot will be the decision makers if weather conditions are favourable for the survey with additional guidance provided by the Ozhiski Protocol. When a wolverine or wolverine track is sighted by the observers, it can be circled to confirm species and tracks, but the circle will not exceed more than 2 km on either side of the transect line (MNRF 2018). All locations of wolverine and wolverine tracks will be logged using the Collector tool for ArcGIS app (ESRI) running on an iPad, waypoints will be recorded in a GPS unit, and georeferenced/ time stamped photos will be taken.

The rotary wing survey is a targeted activity that involves relocating individual sightings, tracks or target search areas that were initially observed, or flagged, during the fixed wing flight on the previous day. Although the goal of the rotary wing survey is targeted on caribou groups, it also provides the opportunity to revisit and further investigate the wolverine signs/sightings from the fixed wing survey. Every effort will be made not to double count individuals or tracks from the fixed wing data if a new individual or track is incidentally observed by the survey crew. All locations of wolverine and wolverine tracks will be logged using the Collector tool for ArcGIS app (ESRI) running on an iPad. Waypoints will be recorded in a GPS unit, and general habitat type will also be recorded. Sightings and signs of moose, caribou and wolves will also be recorded to support multi-species monitoring and to reduce the need for duplicated efforts for other species.

All fur bearers and other species at risk observed incidentally during other field surveys will be recorded and reported to the Natural Heritage Information Centre (NHIC) and the MECP-SARB. For each observation, the species, number, location (UTM), and habitat type will be recorded.

The MFFN CAR Project Consultant and pilot will be the decision makers if weather conditions are favourable for the survey with additional guidance provided by the Ozhiski Protocol. Two additional crew members will be rear seat passengers with their roles and responsibilities following the Ozhiski Protocol. Information on visual observations, tracks, location (UTM) and habitat type will be recorded for Wolverine and other fur bearers on data sheets and / or in ArcGIS Collector with waypoints recorded on a Global Positioning System (GPS) unit and all photos being georeferenced / time stamped. All data will be uploaded to storage devices and / or the cloud at the end of every day. Further guidance from the Ozhiski Protocol will be used regarding data collection methods.

All fur bearers observed incidentally during other field surveys will be recorded. For each observation, the species, number, location (UTM), and habitat type will be recorded.

7.2.3.3 Winter Ground Tracking Survey of Fur Bearers and Other Mammals

The objective of winter ground tracking surveys is to estimate the distribution, abundance, and density of fur bearers and other mammals within the wildlife LSA (3-km buffer). Winter tracking surveys will be conducted by tracking specialists on the ground to estimate the distribution, abundance, and density of fur bearers and other mammals within the LSA. The sampling intensity of winter tracking surveys required to accurately estimate Wolverine abundance in Northern Ontario is unknown due to their low density (Koen et al. 2008). Therefore, Wolverine data from winter tracking will supplement data from aerial tracking surveys and will focus on the 3-km buffer LSA.

A desktop review will be completed to identify a range of habitat types for winter ground tracking surveys to identify fur bearers and other mammals in the wildlife LSA. The winter tracking surveys will follow the methods recommended in *Surveying and Monitoring Wolverine in Ontario and Other Lowland, Boreal Forest Habitats* (Koen *et al.* 2008). Wolverine is a low-density species, so a sampling strategy targeting Wolverine will adequately sample more abundant fur bearers such as American Marten. A modification of the 9-km length triangular transects as described by Koen *et al.* (2008) will be positioned in the smaller 3-km buffer LSA to target fur bearers and other mammals. Due to surveys and helicopter transportation being limited to daylight hours, triangular transects of shorter length (4.5 km in length each) are planned to be surveyed on foot. Two triangular transects will be surveyed in each 15 randomly selected 100 km^2 hexagons intersecting the PDA (30 transects total and 135 km total transect length). The total transect

length (two 4.5 km transects = 9 km) planned per 100 km^2 hexagon is in line with the transect length per 100 km^2 hexagon recommended by Koen *et al.* (2008).

The triangular transects will measure 1.5 km on each side and be positioned to intersect both the PDA and LSA. The positioning of triangular transects within the wildlife LSA will be provided in the upcoming Work Plan. Winter tracking in each transect will be completed within three to ten days of optimal snow conditions (Koen *et al.* 2008) each winter. Winter tracking specialists will document the number of track sets crossing the transect, species, locations and habitat type encountered. Sightings, sign or trackways of any mammals not listed in the TISG will be documented thoroughly and the information will be sent to regulators to expand the species list (the Agency 2020a).

7.2.3.4 Motion Sensitive Camera Tracking for Fur Bearers and Other Mammals

The objective of motion sensitive camera tracking is to estimate the seasonal distribution, abundance, and density of furbearers and other mammals in the Furbearer and Wolverine LSA among years. The study in 2019 deployed 21 wildlife cameras in the LSA from June 13-17 and retrieved the cameras from September 2 to September 4 (Golder 2019). Results of this study will be provided in a separate baseline report. To achieve the program's objectives, remote cameras will be deployed to collect data across all seasons, over two years.

The RECONYX remote camera is a digital camera equipped with an infrared motion detector allowing it to sense both heat and motion with an infrared illuminator, which allows it to take clear pictures at night without using a flash. All components of this camera are contained within a single housing unit. The cameras use a 4 gigabyte (GB) Compact Flash memory card, with a storage capacity of approximately 15,000 images. Cameras will be equipped with lithium AA batteries to extend function over long periods in the field. Camera settings will be programmed to include a first picture delay set at two seconds, trigger sensitivity on high, with two pictures taken one second apart for each time the camera is triggered.

Camera locations will be selected by applying an access-constrained stratification approach in GIS. Locations will be selected with consideration to access and land cover type. The cameras will be deployed on active game trails that intersect the route alternatives and along existing linear disturbances or natural features such as creek banks or habitat edges. Surveyors will document the brand and model of the camera installed, the settings used for photography (i.e., single shot or shutter), and any other technical settings selected. Cameras will be secured to the largest suitable trees to prevent any movement as much as possible facing the linear feature or other habitat selected between 50 and 100 cm above ground level. Vegetation will be cleared from the immediate focal view of cameras to prevent unintentional triggering of the infrared motion sensor due to the motion of brush or twigs.

Sites will be visited in the Fall, Spring and the following Fall to change memory cards and lithium batteries. Cameras will be retrieved in the final Spring. Photos will be downloaded and assessed by a qualified biologist to determine the species, number of individuals, sex, and age after each visit. All wolverine and other species at risk (i.e., caribou) observed in the remote camera monitoring program will be reported to the NHIC and the MECP-SARB.

Additional details on the study design and camera locations will be provided in the Work Plan.

7.2.3.5 Wolverine Hair Snag Trap

As the Wolverine is a SAR that may occur in low densities in the study areas (Magoun *et al.* 2004), special survey methods will be used to provide information about demographics (male:female) in the Wolverine LSA. Hair snag traps are a passive survey method that uses baited posts to attract mammals where a sample of fur may become snagged in barbed wire.

Hair snag surveys will generally follow the methods recommended in *Surveying and Monitoring Wolverine in Ontario and Other Lowland, Boreal Forest Habitats* using 100 km^2 hexagons (Koen *et al.* 2008) and guidance from regulators (**Section 3**). A systematic approach will be used with hair snag survey stations established in each of the 100 km^2 hexagons intercepting the Wolverine LSA (total of 54 hair snag survey stations). Given the low density of Wolverine in the study areas (Magoun *et al.* 2004) and limited road access compared to the recent Wolverine studies in the Red Lake region (Koen *et al.* 2008), this approach for hair snag surveys is expected to be the best use of resources to collect demographic information.

Hair snags will be deployed between mid-February and to the end of May as per the MECP recommendations in two years (pers. comm. in March 2021). Due to the remoteness of the study area, scent lures (if available and practical for implementation) such as Beaver castor or prey scent will be used as attractants applied to a suitable media (e.g., sponge or bone). Two remote cameras will be positioned to monitor the hair snag trap to help confirm if a Wolverine has visited the trap, which will assist in selection of hair samples and provide a photographic record of each individual if possible. During each trap check, Beaver castor or prey scent will be replenished, and hairs will be subsampled from barbs at each hair snag station since hair on adjacent barbs is likely to be from the same individual (Kendall and McKelvey 2008). A record will be kept of hair snag traps deployed, bait deployed, and hair traps checked. Due to comparatively limited access, hair snag traps will be checked monthly to meet the minimum requirements by Koen *et al.* (2008).

DNA laboratories prefer at least 15-20 hair follicles (a minimum of five follicles) to extract sufficient high-quality DNA for analysis. Hair captured will be collected from barbs such that each barb in a snag is

packaged separately in a paper envelope, labelled (snag number, location, barb number date, possible species, collector name), and stored with silica desiccant (Roon *et al.* 2003). Hair samples will be analyzed for the hormone progesterone to determine mature, reproductive females.

7.2.3.6 Habitat Models

Habitat data for fur bearer surveys will be used to develop models to predict the Project effects on this Wildlife VC as described in **Section 9.4**. Habitat data will be based on ELC ecosites or wetland classification modelled across the study areas as described in the Vegetation Study Plan. Fire history of survey sites will be determined using the MNRF Far North Land Cover database (MNRF 2014a) and Ontario's Provincial Satellite Derived Disturbance Mapping digital resource (Government of Ontario 2020). Elevation of survey sites will be determined using the Provincial Digital Elevation Model (MNR 2019). Surficial geology of survey sites will be described using the KGS Group (2019) helicopter reconnaissance of surficial geology.

7.2.4 Pollinating Insects

7.2.4.1 Desktop Review

A desktop review will be completed to describe potential effects to insects with emphasis on pollinating insects. Possible changes to habitat availability, habitat distribution, and mortality risk from vehicle traffic are of particular interest. Geographic Information System (GIS) will be used to examine possible changes to habitat availability and distribution (i.e., terrestrial and aquatic). The review will include an investigation into insect infestations due to recent fire disturbance.

7.2.4.2 Incidental Observations

Incidental observations of pollinating insects will be recorded during all field work and will include identification to highest taxonomic order where possible, numbers, location (UTM), and habitat type.

8. Data Management and Analysis

Data management including quality assurance / quality control (QA / QC) will be employed to minimize potential for data entry and analysis errors, prepare data sets for analysis and limit sensitive data distribution in accordance to established agreements.

Data collection in the field will be completed by field staff using a combination of paper and electronic field forms and mapping software. Data collected will be backed up daily and uploaded onto servers when the internet is accessible. Field data will be reviewed for quality control purposes before any analysis is conducted.

Written descriptions and maps of ecozones, ecoregions, and ecodistricts will be provided as per Ontario's Ecological Landscape Classification, along with landscape features and sensitive or protected areas, and will be completed during desktop analysis and field habitat assessment.

8.1 Bats

The results of the acoustic surveys and desktop information review will:

- provide a species inventory (species present / not detected) for the PDA and LSA
- quantify baseline bat activity using an index to evaluate relative use by habitat type or feature to inform Project siting decisions or predict Project effects on bat habitat;
- locate and confirm high potential habitat for roosts, hibernacula, and foraging
- identify potential migration corridors in the RSA; and
- identify site-specific travel corridors and movement patterns.

The recorded ultrasonic data will be analyzed using the most current version of SonoBat call analysis software (Sonobat, Arcata, CA, USA). This software is designed to convert files, sort, and categorize bat data by species wherever possible, with validation of the species-level classification conducted by a qualified bat acoustic specialist. It identifies bats to species by comparing the recorded ultrasonic patterns (also known as a "pass") to those of known species-specific patterns using their up-to-date classifier. Criteria for defining a pattern as a pass will be determined by a qualified bat acoustic specialist and will be consistently applied across all analyses. The definition of a pass will be provided in the IA / EA. Where the results are compared across years, timing of surveys, equipment and setup protocols will remain consistent

where possible. In some instances, different recording equipment may be required (i.e., Wildlife Acoustics SM3 or SM4 monitors may need to be used interchangeably to capture both bat and bird data).

The classifications will be tallied on a nightly basis to quantify the number of bat passes per night across all bat species or species groups at all monitoring stations. Once nightly tallies are calculated, an average number of bat passes per night will be determined, with standard deviation. For the detections of bat SAR, a total number of passes across the survey and maximum passes within one night will also be calculated. This baseline index of bat activity will be evaluated by habitat type to inform Project siting decisions or predict Project effects on bat habitat.

The bat call sonograms identified by the Sonobat program will then be manually verified by qualified bat acoustic specialists who are familiar with calls of the bat species known from Ontario, including those identified as a bat but of an undetermined species. Manual vetting occurs to assure the patterns are consistent with the typical characteristics of a call for each species.

When the recordings are not consistent with the known typical characteristics of a bat or the recordings are outside the range of the software's ability to apply species identification, the analyzer will assign the recording as "No ID". "No ID" recordings can result from background noise such as insects, rustling plants, wind, incomplete recordings of bat calls, or bats which are outside of the range of the microphone. The "No ID" files will be reviewed by an expert bat ecologist to help to ensure that all potential bat recordings are accounted for in the dataset.

8.2 Amphibians and Reptiles

8.2.1 Amphibian Data Collection and Analysis

Acoustic files collected by ARUs will be analyzed by skilled interpreters familiar with amphibian calls in the RSA. Acoustic files containing substantial environmental (wind, rain) noise will be excluded from the analysis.

One 3-minute data segment recording starting at least one-half hour after sunset until midnight will be randomly selected from ARUs located near wetland habitats over three nights during the breeding bird period for analysis. Any amphibian call detected from ARUs located in non-wetland habitats during the breeding and non-breeding season will provide information about the location of non-breeding sites and possible movements (**Table 7-2**). Incidental amphibian observations during other surveys will provide supplemental information about the location of non-breeding sites and possible movements.

Amphibian acoustic data will be analyzed to describe species richness and distribution within the PDA and LSA. Furthermore, features providing confirmed significant woodland or wetland amphibian breeding habitat will be identified in accordance with the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 3E and 3W* (MNRF 2015b and 2017) considering criterion schedules have not yet been developed for Ecoregions 2E and 2W. Results will be extrapolated across the study areas; for instance, if a confirmed significant amphibian habitat is identified through acoustic surveys, it can be expected that similar such features within the same ecosites can be considered confirmed as well.

8.2.2 Reptile Data Collection and Analysis

Incidental observations of reptiles will be recorded during all field work conducted. Observations may occur from the helicopter or during ground-based field work. Observers will document the species, signs and the UTM location along with representative photographs of the observation.

Reptile incidental data will be summarized according to:

- distribution in the PDA and LSA;
- frequency of occurrence by habitat type; and
- abundance (if possible).

8.3 Fur Bearers

8.3.1 Harvest Record Data

Data from harvest records will be mapped to show relative abundance, historical distribution, trapping effort, and locations of furbearer sightings, specifically in relation to Marten, Beaver and Wolverine. To protect the identity of individual traplines, data will be summarized by WMU when presenting harvest densities (Webb *et al.* 2013). When traplines overlap multiple WMUs, traplines will be assigned to the WMU that encompass the greatest area. Harvest data will be separated into five-year periods to compare long-term trends in harvest distribution, effort and success.

8.3.2 Beaver Lodge Survey

Data from aerial Beaver lodge surveys will be mapped to show the distribution and abundance of Beavers in the PDA and LSA. To quantify hotspots for Beaver activity, density of active Beaver lodges will be classified

as low (60-70 per 100 km^2), medium (71-89 per 100 km^2) or high (90-100 per 100 km^2) based on the average lodge density in northern Ontario (Novak pers. comm. in Thompson 1988). This information will help identify areas of high Beaver activity that may be most vulnerable to Project activities.

8.3.3 Aerial and Winter Ground Track Surveys

Data from aerial and winter ground tracking surveys will be used to determine distribution, abundance, and density (with the exception of Wolverine) of fur bearers in the LSA. For each species, tracks will be quantified per every km of transect searched and corrected for the number of days since last snowfall following Beauvais and Buskirk (1999). Tracks per km of transect will serve as an index of track density to estimate relative population abundance.

Tracking observations will be provided for all fur bearers detected according to:

- distribution in the PDA and LSA;
- frequency of occurrence and abundance (i.e., using the index of track density) for each winter; and
- abundance (i.e., using the index of track density) in each habitat type.

For large mammals, track data provides information on space usage but not necessarily abundance as these animals have large ranges and move great distances in the winter months to find food. However, track data for other fur bearers will help identify high productivity areas more vulnerable to Project activities. A map showing areas of highest concentrations of species including information about WMUs, protected lands, critical SAR habitat, ecozones, ecoregions, and ecodistricts will be provided.

8.3.4 Motion Sensitive Tracking Camera

Data management will include comparing the number of photographs of individual wildlife taken by the camera at a given location. Multiple photographs taken of the same individual in succession will be considered one observation, while those taken of the same species where the time lapse between photographs exceeds one hour will be considered separate observations. For Wolverine, individuals may be distinguished based on their unique pelage pattern and their sex may be distinguished based on their size, which can be compared between photographs to provide more detailed demographic data. The number of individuals recorded by each camera will be divided by the number of days the camera was operating to generate a standardized index of individuals observed per camera per day that allows comparisons to be made among study locations in the PDA and LSA, among seasons, and by habitat type. The number of

days of camera operation will be calculated by subtracting the date of the last photograph taken from the date of installation at each site.

Program CAPTURE (Otis *et al.* 1978) will be used to estimate the population abundance of fur bearers with emphasis on Wolverine. A summary of capture histories will be input into the software to produce an abundance estimate using a standard error and 95% confidence intervals on the estimate and captures probabilities.

Motion Sensitive Tracking Camera observations will be provided for all fur bearers according to:

- distribution in the PDA and LSA;
- frequency of occurrence and abundance by month, season (spring, summer, fall, winter), and year; and
- abundance (i.e., percentage of observations) in each habitat type.

Seasonal occurrence, abundance, and mapping will be provided for the following dates:

- **Spring:** March 21 – June 20
- **Summer:** June 21 – September 20
- **Fall:** September 21 – December 20
- **Winter:** December 21 – March 20

Predictions of mortality effects from increased predator movements will be estimated using motion sensitive tracking camera data. Maps showing areas of highest concentration of species will be used to identify travel corridors crossing planned linear features (i.e., the final route and secondary access roads) where the Project may facilitate predator movements. Program CAPTURE (Otis *et al*. 1978) will be used to estimate abundance of herbivores and predators at these Motion Sensitive Tracking Camera locations. A desktop review will be conducted to provide a summary of species-specific mortality rates due to predation following road construction where available.

8.3.5 Hair Snag Survey

The Project will investigate participating with the Natural Resources DNA Profiling and Forensic Centre at Trent University which worked with the Ontario Boreal Wolverine Project west of the study areas. This DNA laboratory has Wolverine samples profiled at 11 microsatellite loci which will enable species identification and profiling at microsatellite markers. DNA analysis will obtain information about genetic diversity (i.e., individual uniqueness and relationship to other Wolverines) and effective population size. Hormone analysis

will be done on the hair samples if sufficient samples are collected to determine maturity / reproductive status of the females.

8.3.6 Incidental Observations

Incidental observations of wildlife will be recorded during all field work conducted. Observations may occur from the helicopter or during ground-based field work. Observers will document the wildlife species, wildlife signs (e.g., scat, tracks, dens, fur) and the UTM location along with representative photographs of the observation.

8.4 Pollinating Insects

The results of the desktop review and incidental observations collected during field surveys will provide information on habitat availability and distribution of insect species in the PDA, LSA and RSA. An effects assessment on pollinating insects will be conducted based on the results of the desktop review and incidental observations in the PDA and LSA.

8.5 Species at Risk

SAR data collected from desktop review, existing data and field studies will be used to describe the distribution and abundance of SAR within the PDA, LSA and RSA. Desktop studies will include published studies and recovery strategies that describe the regional importance of SAR, such as Wolverine occupancy models describing their distribution in the far north (Ray *et al.* 2018). The most up to date recovery documents and species statuses will be consulted.

Mapping will be provided displaying the PDA and LSA for each VC in terms of their residences, seasonal movement corridors, habitat requirements, critical habitat and recovery habitat. All SAR, along with their critical habitat and residences within the PDA and LSA will be mapped. The locations of these SAR critical habitat and residences in relation to federal land will also be indicated in the map figures. Sensitive areas for SAR in the RSA will be assessed through desktop analysis, including identifying critical habitat where it has not been defined or only partially defined. A summary of each SAR will provide distribution across survey sites at which they were detected and abundance in each habitat type where possible. A map showing the areas of highest concentrations or areas of use will be provided.

Baseline information will be used to evaluate impacts on SAR within the defined RSA's through the effects assessment process. The effects assessment will describe how the general life history of SAR as well as their critical habitat may be affected by the Project.

8.6 GIS

Where baseline data are available in GIS format, this information will be provided to the Agency as electronic geospatial data files compliant with the Industrial Standards Organization (ISO) 19115 standard. This will support the Government of Canada's commitment to Open Science and Data and facilitate the sharing of information with the public through the Canadian Impact Assessment Registry Internet Site and the Government's Open Science and Data Platform. The Agency intends to make the geospatial data files available to the public under the terms of the Open Government License – Canada. In addition, all baseline data available in GIS format will also be provided to the MECP's SAR Branch and the MNRF's NHIC as complete data sets from all surveys

Complete data sets from all survey sites will be provided. However, data sets will need to comply with data sharing licences obtained for the Project. They will be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation / visit information and with observations and measurements in un-summarized form. In some instances, SAR data and Indigenous Knowledge information may need to be generalized. Databases and GIS files will be accompanied by detailed metadata that meets ISO 19115 standards. Documentation and digital files will be provided for all results of analyses that allow for a clear understanding of the methods and a replication of the results.

9. Effects Assessment

The following sections provide discipline-specific input and considerations as they pertain to the methodology for effects assessment. The Project is in the early stage of the IS / EA Report preparation and it is expected that the effects assessment methodology will be refined iteratively based on regulatory agency guidance, professional judgment and input received through the Project consultation and engagement process.

9.1 Project-Environment Interactions

The Project activities that may result in changes to the environment are described within the identified temporal and spatial boundaries. This includes identification of both direct and indirect changes by comparing the existing setting to the conditions anticipated to occur as a result of the Project For each environmental discipline, the likely Project-environment interactions will be identified based on professional judgment, activities listed in TISG Section 3.2 (the Agency 2020a) as well as projects of similar magnitude and / or location.

A preliminary analysis of Project-environment interactions for the Wildlife VCs is provided in **Table 9-1** and will be confirmed during the IA / EA process to identify the Project-environment interactions that are likely to have a potential effect, and to identify measures to avoid or minimize potential negative effects and enhance benefits.

Table 9-1: Project – Environment Interactions

Project Phases	Project Activities	Wildlife
Construction Phase	*Mobilization of Equipment and Supplies*	X
	Temporary Construction Staging Areas[1]	X
	Temporary Access Roads and Trails[1]	X
	Temporary Construction Camps[1]	X
	ROW Clearing and Grubbing	X
	Brush and Timber Disposal	X
	Pits and Quarries[1]	X
	Drilling / Blasting / Aggregate Production	X
	Road Construction (stripping, subgrade excavation, embankment fill placement, grading, ditching)	X
	Bridge and Culvert Installation (approach embankments, foundations, substructures, superstructures, traffic protection, erosion controls)	X
	Construction Site Restoration	X

Project Phases	Project Activities	Wildlife
Construction Phase: Decommissioning	*Pits and Quarries*	X
	Temporary Camps, Roads / Trails and Staging Areas	X
Operations Phase	*Road Usage*	X
	Maintenance[2]	X

Notes: 1. Includes construction and use of
2. Includes General Maintenance (e.g., grading, erosion control, quarrying, pits), Seasonal Maintenance (e.g., snow clearing, bridge and culvert maintenance), and Special Maintenance (e.g., slope failures, road settlement / break-up.).

9.2 Valued Components and Indicators

VCs are the environmental, health, social, economic or additional elements or conditions of the natural and human environment that may be impacted by a proposed project and are of concern or value to the public, Indigenous peoples, federal authorities and interested parties (the Agency 2020b). Indicators represent the resource, feature, or issue related to the VC that, if changed, may demonstrate an effect on the environment. The indicators and rationale for selection and measurement of potential effects to be used to assess and evaluate the alternative routes in the IS / EA Report are provided in **Table 9-2**. The table includes both quantitative and qualitative indicators. The final list of VCs and indicators to be used in the IS / EA Report will be based on regulatory agency guidance, professional judgement and input received through the Project consultation and engagement process.

Table 9-2: Wildlife Indicators

Valued Component	Indicators	Rationale for Selection
Bats *(including SAR – Little Brown Myotis, Northern Myotis, Tri-colored Bat)*	■ Species presence ■ Relative abundance (spatially and temporally) ■ Habitat availability and distribution (spatially and temporally) including critical habitat for SAR ■ Predator-prey dynamics	■ SAR (both federally under SARA and provincially under the ESA). ■ International conservation implications are associated with the species.
Fur Bearers *(American Marten, Beaver and SAR Wolverine)*	■ Species presence ■ Relative abundance (spatially and temporally) ■ Habitat availability and distribution (spatially and temporally) including critical habitat for SAR ■ Predator-prey dynamics	■ SAR (both federally under SARA and provincially under the ESA). ■ Cultural significance as well as economic and social implications associated with this VC.
Amphibians and Reptiles	■ Species presence ■ Relative abundance (if possible both spatially and temporally) ■ Habitat availability and distribution (spatially and temporally) ■ Predator-prey dynamics	■ Cultural and social significance associated with this VC.
Pollinating Insects	■ Habitat availability and distribution (spatially and temporally)	■ Significant role in the food web and pollination of plant species.

The VCs of the Wildlife Discipline have been determined through consideration of the following factors listed in the TISG[10] (the Agency 2020a):

- VC presence in the study area;
- the extent to which the VC is linked to the interests or exercise of Aboriginal and Treaty Rights of Indigenous peoples, and whether an Indigenous group has requested the VC;
- the extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the VC;
- the extent to which the VC may be under cumulative stress from other past, existing or future undertakings in combination with other human activities and natural processes;
- the extent to which the VC is linked to federal, provincial, territorial or municipal government priorities (e.g., legislation, programs, policies);
- the possibility that adverse or positive effects on the VC would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments; and
- whether the potential effects of the Project on the VC can be measured and / or monitored or would be better ascertained through the analysis of a proxy VC.
- species with conservation status, ecological and / or socio-economic value;
- abundance or rarity of a feature;
- social or economic importance;
- traditional, cultural and / or heritage importance; and
- any other relevant and credible source, such as scientific or academic publications or input from the public.

Inputs received to date from Indigenous communities, agencies and interested persons through the Consultation and Engagement Program, including inputs received on the Draft ToR, have also been used to inform the selection of the VCs and indicators for the Wildlife discipline.

10. *The TISG also states that information from ongoing and completed regional assessments in the proposed area of the Project should be used to inform VCs for the Project. In February 2020 a regional assessment of the Ring of Fire region commenced; however, it is not sufficiently advanced at this time to inform the Project VCs. The VCs will be consulted and engaged on early in the IA/ EA process and finalized taking into consideration the input received. Therefore, only information relevant to the Project that arises from the regional assessment of the Ring of Fire within an appropriate timeline will inform the VCs for the Project.*

9.3 Potential Effects

A direct effect occurs through the direct interaction of an activity with an environmental discipline. The Project-environment interactions currently anticipated, based upon preliminary analysis, to result in direct effects to the Wildlife discipline have been identified in **Table 9-1**. The potential direct effects resulting from the Project-environment interactions will be confirmed during the IA / EA process and will be based on input received through the Indigenous Knowledge Program and Consultation and Engagement Program, regulatory agency guidance, and professional judgement.

An indirect effect occurs when a change to one environmental discipline resulting from a Project activity causes a change to another environmental discipline (e.g., changes in groundwater could indirectly affect wildlife). **Table 9-3** provides a preliminary identification of how changes to Wildlife may result in indirect effects to other environmental disciplines.

9.4 Methods for Predicting Future Conditions

With respect to quantitative models and predictions, the IS / EA Report must detail the model assumptions, parameters, the quality of the data and the degree of certainty of the predictions obtained.

A variety of modelling approaches suggested in the TISG will be explored to explain the spatial and temporal patterns for each Wildlife VC as a function of environmental and explanatory variables to predict future conditions (the Agency 2020a). False-positive occupancy models are proposed for bats (Layng *et al.* 2019) and Hierarchical Bayesian Occupancy Models are proposed for amphibians (Millar and Grant 2015) and fur bearers (Ray *et al.* 2018). These modelling approaches were used recently in similar studies for bats (Layng *et al.* 2019) and Wolverine (Ray *et al.* 2019) in adjacent areas. The following section explains the general approach to modelling.

9.4.1 Wildlife Habitat Model Development

Wildlife habitat models will be developed by first providing an account summarizing known preferences for biotic and abiotic variables for each Wildlife VC. Models will be developed to evaluate how these biotic and abiotic predictor variables best explain the spatial and temporal patterns of presence / absence, abundance, density and / or distribution of Wildlife VCs (**Table 9-4**). All model assumptions, predictor variables, data quality, and the degree of certainty of the predictions will be described.

Table 9-3: Potential Discipline Interactions

Discipline and Associated Valued Components	Aboriginal Treaty Rights and Interests	Atmospheric Environment	Acoustic and Vibration Environment	Physiography, Geology, Geochemistry, Terrain and Soils	Surface Water	Groundwater	Vegetation	Wildlife	Fish and Fish Habitat	Social	Economy	Land and Resource Use	Human Health and Community Safety	Visual Aesthetics	Archaeological and Cultural Heritage
Wildlife ■ Bats ■ Fur Bearers ■ Amphibians ■ Pollinating Insects ■ Reptiles	X	X	X	X	X	X	X		X	X	X	X	X	-	-

Notes: X = Potential pathway for indirect effect as a result of the Project.
- = No pathway for indirect effect is anticipated as a result of the Project.

Table 9-4: Model Variables

Dependent Variables	Independent Variables	
	Biotic	**Abiotic**
Presence / Absence, Abundance, Density, Distribution	■ Ecozone – Northern Ontario – Hudson Bay Lowlands ■ Land Cover – coniferous treed – coniferous / thicket swamp – deciduous treed – disturbance – non and sparse woody – disturbance – treed and / or shrub / sparse treed – mixed treed – treed and open bog – treed and open fen ■ ELC ecosites (see Banton *et al*. 2009) ■ Wetland Class – bog (basin, blanket, collapse scar, domed, flat, lowland polygon, mound, palsa, peat mound, peat plateau, plateau, polygonal peat plateau, riparian, slope, string, veneer) – fen (basin, channel, collapse, scar, feather, horizontal, lowland polygon, palsa, riparian, slope, spring, string) – marsh (basin, hummock, lacustrine, riparian, slope, spring – swamp (discharge, flat, mineral-rise, raised peatland, riparian, slope) – shallow water (basin, lacustrine, riparian) ■ Distance to open water (for amphibian surveys) ■ Aboveground biomass using the Normalized Difference Vegetation Index (NDVI) (for bats surveys) ■ Habitat arrangement and connectivity – core area – shape – proximity / isolation – contrast – contagion / interspersion	■ Surficial Geology – organic deposits - in fen wetlands – organic deposit – in bog wetlands – fluvial deposits (recent) – fluvial deposits (abandoned) – marine beach and nearshore deposits – glaciolacustrine beach and nearshore deposits – glaciolacustrine basin deposits – glaciofluvial ice-contact deposits – till: massive to bedded diamicton, clayey silt to sandy silt to silty sandy to thin sediment over bedrock to bedrock ■ Provincial Digital Elevation Model (m) – local – aspect – surface roughness ■ Disturbance Type and Year (1985-2010) ■ Climatic variability – temperature (ºC) – cloud cover (%) – wind velocity (Beaufort scale) – cumulative precipitation prior to survey (i.e., previous week or winter) for amphibian surveys – thawing degree-days (for aerial tracking surveys) ■ Time – year – season (dummy variable: breeding season or non-breeding season (for amphibian surveys; winter, spring, summer fall for fur bearers) – survey date – survey time – days since snowfall (for aerial and winter tracking surveys) ■ Other Effects – Observer ■ Location (UTM easting and northing) ■ Road density (for Wolverine)

9.4.1.1 Wildlife VC Accounts

For each Wildlife VC selected for modelling, a summary will be provided of its geographic distribution, life requisites, and seasonal habitat requirements. This information will be summarized following a literature review of the species biology, including information on preferred biological and physical habitat features. Important habitat features may include certain preferred biotic variables, such as vegetation types that may provide forage and shelter and / or abiotic variables such as climatic conditions, surficial geology, elevation limitations, slope, or aspect preferences. Published studies that describe the regional importance, abundance and distribution of SAR, including recovery strategies and plans will also be used and referenced in the IS / EA Report.

9.4.1.2 Predictor Variables

Biotic variables for Wildlife VCs will be examined at larger spatial scales by ecozone, land cover, habitat arrangement and connectivity (**Table 9-4**). Ecozones are included in models because the Hudson Bay Lowlands Ecozone has shown low Wolverine occupancy compared to the Northern Ontario Ecozone (Ray *et al*. 2018) and similar patterns may be found in other wildlife VCs. Land cover will describe wildlife habitat based on the MNRF Far North Land Cover database (MNRF 2014a) modified to describe fire disturbed habitats using Ontario's Provincial Satellite Derived Disturbance Mapping digital resource (Government of Ontario 2020; Hermosilla *et al.* 2016). Distance to open water has been found to be a significant predictor for some amphibian species (Bayne and Muhly 2014) and will be included in amphibian models. Aboveground biomass using the Normalized Difference Vegetation Index (NDVI) using Landsat has been used in bat models in Northern Ontario (Layng *et al.* 2018). To examine the influence of habitat arrangement and connectivity in wildlife models, GIS measurements of landscape pattern metrics of fragmentation and may include core area, shape, proximity / isolation, contrast, and contagion / interspersion (Wang *et al.* 2014).

Biotic variables for Wildlife VCs will be examined at finer spatial scales by ELC ecosites or wetland class as described in the Vegetation Study Plan (**Table 9-4**). Vegetation characteristics of the ELC ecosites describe forest structural stage and canopy closure. Structural stage will be divided into multiple classes ranging from unvegetated to old growth forest which may be suitable for different species, depending on the season. Canopy closure will be measured in percent closure and can affect the distribution and relative abundance of understorey growth, which in turn affects habitat selection by wildlife. ELC ecosites also describe soil types which are strong drivers of vegetation community composition.

Abiotic variables for Wildlife VCs will include surficial geology (KGS Group 2019) and elevation (m), slope (degrees), and aspect (degrees) (**Table 9-4**). Abiotic variables will include location based on UTM easting

and northing. Temporal patterns of climatic variability will be examined by year, specific seasons (i.e., all seasons, spring, summer, fall, winter, growing season), survey date (i.e., survey round date), and survey time (i.e., hour of day) especially in regard to weather data such as temperature (ºC), cloud cover, and wind velocity (Beaufort scale). Unique climatic variables will be included in some models. Cumulative precipitation prior to survey date and total precipitation for the previous winter will be used for amphibian models. Thawing degree days (total number of days per year with mean temperature > 0º Celsius) and days since snowfall will be used for Wolverine (Ray *et al.* 2018). Road density has been found to have an influence on Wolverine densities in Northern Ontario (Dawson *et al.* 2010) and will be included in Wolverine models calculated as length of winter roads only and primary, secondary and tertiary roads obtained through the Forest Resource Inventory (FRI) 1:20 000 digital maps (OMNR, unpublished data).

9.4.1.3 Model Fit and Selection

Candidate models will be compared using metrics that represent model accuracy and will penalize models with a greater number of covariates, by utilizing Akaike's Information Criterion (AIC) (Akaike 1978) and Bayesian Information Criterion (BIC) (Burnham and Anderson 2004). The best candidate models will be selected using all possible combinations of the covariates in **Table 9-4** (Burnham and Anderson 2004). Leave-one-out cross-validation will help determine the best covariates for a model, which entails withholding one point and re-fitting the model on the rest of the observations and repeating this process for each available observation (Allen 1974). By comparing the residuals (observed vs. predicted) of each of these model predictions from the leave-one-out cross-validation to each covariate, an indication of the bias each covariate may be contributing to model predictions can be ascertained.

The variance inflation factor (VIF) of models will be examined to quantify the multi-collinearity of all predictor variables (Longnecker and Ott 2004). If the VIF exceeds five (Longnecker and Ott 2004), multivariate analysis will be used such as principal component analysis (PCA) for linear models or non-metric multi-dimensional scaling (NMDS) for non-linear models to simplify the dataset by yielding fewer unrelated factors (McCune *et al.* 2002).

9.4.1.4 Model Confidence Resolution

The model performance, such as the regression coefficient for bat occupancy models (Layng *et al.* 2019) and deviance for amphibian Hierarchical Bayesian Occupancy Models (Miller and Grant 2015) and fur bearer Hierarchical Bayesian Occupancy Models (Ray *et al.* 2018) will be provided to determine the variance in the response explained by the model. These measures of model confidence were selected to allow for comparisons to similar studies with some being adjacent to the Project area. All models will target 95% confidence intervals on estimates of presence / absence, abundance, and / or distribution.

9.4.2 Predicted Effects of the Project

The direct, incidental and predicted positive and / or adverse effect of the Project on each Wildlife VC will be predicted using models based on anticipated changes to habitat availability, fragmentation, ground instability and species abundance with respect to anticipated activities during the Project's construction and operations phase.

The predicted effects for all Wildlife VCs will follow *A Framework for the Scientific Assessment of Potential Project Impacts on Birds* (Hanson *et al.* 2009*)*. When possible, pre-construction baseline data will be used to calculate the following as summarized for each Wildlife VC in **Section 8**:

- frequency of occurrence;
- abundance (density when possible);
- abundance (density when possible) in each habitat type; and
- a map showing distribution and areas of highest concentration.

Models will be used to extrapolate abundance (i.e., mean across years or density when possible) and distribution (i.e., mean across sites) at the PDA, LSA and RSA scale. Individual effects on Wildlife VCs that may be predicted using models and/or desktop review include:

- Site preparation / vegetation removal;
- Air emission and dust;
- Deposit of harmful substances in waters;
- Changes to the aquatic flow regime and sediment load;
- Changes to geological features;
- Introduction of invasive species and spread of disease;
- Sensory disturbance;
- Increased predation opportunities;
- Disruption of wildlife movement corridors;
- Increased trapping / harvesting, poaching and recreational resource use opportunities; and
- Site reclamation.

Models will be used to extrapolate abundance of each Wildlife VC to the RSA based on habitat availability where possible. Direct habitat loss for Wildlife VCs is likely at the PDA scale; whereas, habitat fragmentation is likely at the LSA scale and possibly at the RSA scale. Models will be used to estimate the

probability of each Wildlife VC being present at each survey point post-construction in consideration of habitat loss and fragmentation. Any assumptions of displacement will be justified with scientific references and best management practices. Short and long-term habitat changes and food sources of fauna will be described and documented including changes in terms of the health, integrity and availability of habitats related to wildlife.

The IA / EA will consider the resilience of Wildlife VCs (includes SAR and SOCC) and associated habitat to the effects of the Project. Ecological processes will be evaluated for potential susceptibility to adverse effects from the Project such as considerations for patterns and connectivity of habitat patches and continuation of key natural disturbance regimes. This evaluation will include the predicted impact of new habitat types such as clearings on SAR. The IA / EA will also consider potential adverse effects from the Project on hydrological processes associated with fen and bog complexes. More specifically, the IA / EA will examine how the Project may affect the flow of water through the transitional zone between the Ontario Shield and Hudson Bay / James Bay Lowlands and the resulting changes to land cover and vegetation associated with SAR habitat.

Several SAR are included as Wildlife VCs. Potential direct incidental, and adverse effects of the Project will be assessed on SAR including critical habitat where applicable (e.g., the effects of quarries built on or near eskers on SAR). For each SAR, a summary will be provided of survey results with detailed mapping of habitat, including important habitat features. Mapping will differentiate between federal and non-federal lands within the study areas when presenting SAR information. Provincial, territorial or federal permits that may be required in relation to the SAR will be described. Reasonable alternatives to the Project will be described to avoid potential effects on SAR and their habitat. Particular attention will be paid to critical habitat and habitat of species important to current use of lands and resources for traditional purposes such as breeding areas for amphibians, and roosting habitat for bats. The IS / EA Report will describe all feasible measures to avoid or minimize the effects of the Project on SAR and their habitats, including critical habitats. Critical timing windows (e.g., denning, breeding, roosting), setback distances, or other restrictions that will be imposed or followed will be considered in assessing predicted effects for all species. The IS / EA Report will provide an account of how the Project and mitigation measures are consistent with the recovery strategy, action plan, or management plan for each SAR. The IS / EA Report will include a list of mitigation measures including offsetting and compensation as necessary that will be employed by the Project.

9.5 Mitigation and Enhancement Measures

Once potential effects have been identified, the effects assessment will explore technically and economically feasible mitigation measures to avoid or minimize the identified negative effects and enhancement measures to increase positive effects beyond those that are already inherent to the design. These measures will consist of industry-standard practices, federal and provincial standard specifications, regulator-mandated measures, best management practices, Indigenous and community recommendations and recommendations from industry and environmental professionals based on expertise, scientific publications, experience and judgement, such as the *Significant Wildlife Habitat Mitigation Support Tool* (MNRF 2014e).

It is important that mitigation and enhancement measures are achievable, measurable and verifiable and monitored for compliance and effectiveness during all temporal phases as part of the Project follow-up monitoring plan. Required environmental monitoring will verify the potential environmental effects predicted in the IS / EA Report, evaluate the effectiveness of mitigation and enhancement measures, and identify the process the Proponent will follow if mitigation and enhancement measures are not effective.

9.5.1 TISG Section 20 Requirements

The TISG Section 20 requirements for Wildlife are listed below (the Agency 2020a). The applicability of these requirements will be determined in the IA / EA.

- In relation to bats, mitigation measures should be developed in collaboration with federal authorities and included in the Impact Statement. In addition, the following mitigation measures should be considered by the proponent:
  - follow decontamination protocols for White-nose Syndrome by the Canadian Wildlife Health Co-operative; and
  - apply appropriate mitigation measures, such as timing windows and setbacks, to all areas with potential roosting habitat, unless each structure is individually assessed and verified to not be used for roosting.
- Include measures to address sensory disturbance and the resulting functional loss of habitat.
- Incorporate Wildlife friendly road-design principles and features, which may include underpasses and wildlife bridges (as well as monitoring to estimate bat and other wildlife mortality).
- Identify measures to prevent and mitigate the risk of engaging in harmful, destructive or disruptive activities in key sensitive periods and locations (e.g., hunting season) to wildlife and wildlife habitat.

- In relation to bats, mitigation measures should be developed in collaboration with federal authorities and be included in the IA. In addition, the following mitigation measures should be considered by the proponent:
  - specifically address mitigation of effects to eskers and related features rich in aggregate material, as these are important features for bat hibernacula;
  - describe the effectiveness of different mitigation options taking into consideration the configuration of resources in the environment, and how local bat populations are using these resources. Describe how bat behaviour (differentiated by species) was taken into account by considering the geographic location and time-period;
  - at a minimum, the following mitigation should be applied:
    - spatial avoidance (setbacks):
    - 120 m is recommended; and
    - for tree roosts, apply setbacks to the entire maternity roost complex and for hibernacula apply setback to entire underground cave / mine network.
  - Temporal avoidance (timing of disturbance, roost destruction or exclusion):
    - Avoid disturbance, destruction and exclusion between April 30 – September 1.
    - Manage vegetation at bridges and other commuting corridors that intersect highways:
    - Manage vegetation height and tree canopy height so that it is not in line with the height of traffic; and
    - Include bat monitoring at bridges, close to significant habitat features (e.g., roosts, hibernacula, significant foraging habitats) and identified bat commuting corridor locations to estimate mortality. Where mortality is higher than background rates, compensation measures are required to reduce mortality.
  - Lighting:
    - Avoid or minimize the use of artificial light in bat habitats;
    - Select lower intensity lighting;
    - Use lighting fixtures that restrict or focus illumination to target areas; and
    - Avoid lights that emit blue / green / white / ultraviolet (UV) wavelengths.
    - Other compensation (offsets / tradeoffs).
- Provide best technically and economically feasible mitigation approaches to habitat mitigation that follow the hierarchy:
  - Avoid potential impact;
  - Minimize potential impact;

- Provide biodiversity offsets to address any residual adverse environmental effects that cannot be avoided or sufficiently minimized; and
- Provide justification for moving from one mitigation alternative to the next.

- Provide offsetting or compensation plans to address all residual effects to SAR, and their critical habitat, migratory birds, fish and fish habitat and /or wetland functions (if applicable) for review during IA / EA process; the plans should:
  - Describe the baseline condition of the SAR, critical habitat, migratory birds and wetland functions potentially impacted by the Project;
  - Apply the mitigation hierarchy;
  - Identify and describe residual effects;
  - identify a compensation ratio with rationale, including how any policies or guidance provided by federal authorities, provincial authorities and Indigenous groups have been considered;
  - Identify the location and timing of implementation of compensation projects (where feasible);
  - Identify and describe the success criteria;
  - Identify and detail non-habitat measures;
  - Describe how the proposed measures align with published provincial and federal recovery, management, or action plans and strategies for SAR;
  - Identify the parties responsible for implementation, including monitoring and review;
  - Identify indicator species for setting compensation objectives. Identification should be based on baseline data, and other information where available (note: SAR should not be used as indicator species; compensation efforts need to be directed specifically to these species);
  - Describe the functions gained at the compensation site(s);
  - Provide evidence that functions can be replaced by the proposed offset activities;
  - Describe the process of selecting proposed compensation site(s) and associated baseline condition(s); and
  - Provide a description of the monitoring schedule and activities to be completed to monitor the success of compensation activities.

9.6 Residual Effects

Residual effects are the effects remaining after the application of mitigation measures. The IS / EA Report will describe in detail the potential adverse and positive residual effects in relation to each temporal phase of the Project (e.g., construction, operation). Residual effects will be described using criteria to quantify or qualify adverse and positive effects, taking into account any important contextual factors. The residual effects will therefore be described in terms of the direction, magnitude, geographic extent, duration, frequency, likelihood, and whether effects are reversible or irreversible[11]. Ecological and socio-economic context may also be relevant when describing a residual effect. Context relates to the existing setting, its level of disturbance and resilience to adverse effects. Context can also relate to timing as it applies to assessing the worst-case scenario (e.g., effect during migratory or calving season for wildlife). Where appropriate, information regarding residual effects will be disaggregated by sex, gender, age and other community relevant identifying factors to identify disproportionate residual effects for diverse subgroups.

9.6.1 Magnitude

For magnitude, environmental discipline-specific definitions are required and are proposed below in **Table 9-5** and are based on professional judgment and applicable regulator guidance, where available.

Table 9-5: Wildlife Magnitude Definition

Magnitude Level	Definition	Rationale
Negligible	■ Small scope of effect and slight severity of effect to Wildlife VCs.	■ Wildlife and their habitat will be affected across 1-10% of their population or occurrence within the Study Area and are likely to be only slightly degraded in function or reduced in population by 1-10 % within ten years or three generations.
Low	■ Restricted scope of effect and moderate severity of effect to Wildlife VCs.	■ Wildlife and their habitat will be affected across 11-30% of their population or occurrence within the Study Area and will likely be moderately degraded in function or reduced in population by 11-30 % within ten years or three generations.
Medium	■ Large scope of effect and serious severity of effect to Wildlife VCs.	■ Wildlife and their habitat will be affected across 31-70% of their population or occurrence within the Study Area and will likely be seriously degraded in function or reduced in population by 31-70% within ten years or three generations.
High	■ Large to pervasive scope and high to extreme severity of effect to Wildlife VCs.	■ Wildlife and their habitat will be affected across all or most (71-100%) of their population or occurrence within the Study Area and will likely be destroyed or eliminated or reduced in population by 71-100% within ten years or three generations.

11. TISG Section 13.1 identifies additional effects characteristics for certain disciplines (e.g., wetlands, birds, terrestrial wildlife, species at risk). These additional effects characteristics are described in the respective discipline-specific Study Plans.

9.7 Consideration of Meeting Canada's Environmental Obligations

The environmental obligations assessment for the Project will be undertaken on the preferred alternative and will characterize the Project's contribution to Canada's ability to meet its environmental obligations incorporating the requirements set out in Section 24 of the TISG (the Agency 2020a).

Federal environmental obligations identified for this Project include:

1. Convention on Biological Diversity and Canada's supporting national framework (i.e., Canadian Biodiversity Strategy, Canada's Biodiversity Outcomes Framework, and current Biodiversity Goals and Targets for Canada); and legislation that supports how the implementation of Canada's biodiversity commitments including the SARA, and the *Canada Wildlife Act (1985)*, as well as supporting guidance.

    a. Recovery Strategies and Action Plans developed under the SARA for all species potential affected by the Project

The IS / EA Report will describe:

1. How the Project's effects (including contribution to cumulative effects) may contribute to Canada's ability to meet its obligations (e.g., related to biodiversity); and

2. How the Project's effects (including contribution to cumulative effects) may hinder Canada's ability to meet its obligations.

Where the Project may contribute to Canada's ability to meet these obligations, the IS / EA Report will describe plans and commitments to help to ensure that positive contributions are met. As well, where the Project may hinder Canada's ability to meet these obligations, the IS / EA Report will describe how the Project will first try to avoid and then to mitigate these potential effects, including management plans, risk assessment, and relevant follow-up and monitoring activities. The IS / EA Report will include expected indicators and data collection methods to support any of these plans.

In assessing whether the Project may contribute or hinder meeting these obligations, the IS / EA Report will also include how community and Indigenous Knowledge will be incorporated through consultations.

9.8 Consideration of Sustainability Principles

The following provides a generic description of how sustainability principles will be considered in the effects assessment. The extent to which sustainability principles apply to a specific VC will vary depending on the nature of the VC and the potential for Project effects on the VC.

The effects assessment approach for the Project has included the consideration of the sustainability principles outlined in the Project TISG and the Agency's guidance on sustainability (the Agency 2020a). The sustainability principles that have been considered include:

1. Consider the interconnectedness and interdependence of human-ecological systems;
2. Consider the well-being of present and future generations;
3. Consider positive effects and reduce adverse effects of the Project; and
4. Apply the precautionary principle by considering uncertainty and risk of irreversible harm.

The interconnectedness and interdependence of human-ecological systems will be considered through the assessment of potential indirect effects of each alternative. An indirect effect occurs when a change to one environmental discipline resulting from a Project activity causes a change to another environmental discipline (e.g., changes in vegetation could indirectly affect wildlife). A preliminary assessment of indirect effects has been included in **Section 9.3**.

The well-being of present and future generations will be considered in the effects assessment through the application of the long-term operations phase temporal boundary of 75 years (**Section 6.1**) and through the effects characteristics description of duration and reversibility for each residual effect predicted.

The consideration of positive effects and reducing adverse effects of the Project is fundamental to the effects assessment methodology through the identification of mitigation measures to reduce potential adverse effects and the identification of the preferred alternative through the evaluation of advantages (e.g., positive effects) and disadvantages (e.g., adverse effects).

The effects assessment will apply the precautionary principle by clearly describing and documenting all uncertainties and assumptions underpinning the analysis and identifying information sources. The effects assessment will consider risk of irreversible harm through the effects characteristics description of reversibility for each residual effect predicted and will describe any uncertainty associated with the assessment of residual effects.

The scope of the sustainability assessment will be defined by issues of importance identified by Indigenous communities and interested persons through consultation and engagement activities, while also ensuring to be inclusive of the diversity of views expressed. The selection of VCs that will be the focus of the sustainability assessment will be aligned with the issues of importance identified by Indigenous communities and interested persons, as well as residual effects identified through the effects assessment process. The sustainability assessment will describe how the planning and design of the Project, in all phases including follow-up monitoring, considered the sustainability principles.

9.9 Consideration of Identity and Gender-Based Analysis Plus in Effects Assessment

The Proponent recognizes that communities and sub-populations within those communities may be impacted differently by the Project with respect to VCs and indicators. As such, the Project aims to collect baseline information for the purpose of assessing differential effects and establishing relevant mitigation measures, as further elaborated on in **Section 4.3**. Gender-Based Analysis Plus will not be limited to community feedback, when offered or discussed in secondary texts, additional sub-population information as is applicable to the relevant assessment will be incorporated.

9.10 Follow-up Programs

A follow-up program verifies the accuracy of the effects assessment and evaluates the effectiveness of mitigation measures. Identification of follow-up programs for the Project are not described in this Study Plan as the information needed to determine environmental monitoring requirements is dependent on the outcome of the effects assessment and consultation with Indigenous communities, agencies and interested persons. For instance, offsets required as part of ESA or SARA permitting will incorporate a follow-up program, however an effects assessment and consultation will need to take place prior to formalization of a program. Therefore, the Proponent will include information on follow-up programs, that address the requirements outlined in Section 26 of the TISG (the Agency 2020a), in the IS / EA Report and will identify the compliance and effects monitoring activities to be undertaken during all phases of the Project, as required. With respect to bat-specific follow-up programs, post construction monitoring to evaluate any changes in bat communities following Project construction and evaluate the effectiveness of applied mitigation may be considered in the IS / EA Report.

10. Assumptions

Any assumption used in the effects assessment, for example the assumed average daily traffic on the CAR, will be clearly identified and a rationale provided in the IS / EA Report.

11. Concordance with Federal and Provincial Guidance

This section provides the best information currently available on how federal and provincial requirements identified for the Project to date will be addressed. The final concordance with federal and provincial requirements will be included in the IS / EA Report, and will be based on regulatory agency guidance, professional judgement and input received through the Project consultation and engagement process.

Table 11-1: Study Plan Federal Concordance – Conformance with Requirements

ID#	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
1	TISG Section 1.1, page 4	■ The Guidelines correspond to factors to be considered in the impact assessment. These factors are listed in subsection 22(1) of IAAC and prescribe that the impact assessment of a designated project must take into account any change to the designated project that may be caused by the environment;	■ The potential effects of the project on the environment and the potential effects of the environment on the project will be assessed in accordance with applicable standards and guidance.	■ Section 9.1
2	TISG Section 2.3, pages 6-7	■ The description should focus on aspects of the Project and its setting that are important in order to understand the potential environmental, health, social and economic effects and impacts of the Project. The following information must be included and, where appropriate, located on map(s): – geographic coordinates (i.e., longitude/latitude using international standard representation in degrees, minutes, seconds) for the beginning and end points of the proposed road; – current land and/or aquatic uses within the study areas; – distance of the project components to any federal lands and the location of any federal lands within the study areas; – all waterbodies and their location on a map; – navigable waterways; – the environmental significance and value of the geographical setting in which the Project will take place and the study areas; – environmentally sensitive areas, such as national, provincial, territorial and regional parks, UNESCO World Heritage Sites, geological heritage sites, ecological reserves, ecologically and biologically sensitive areas, wetlands, and habitats of federally or provincially listed species at risk and other sensitive areas; – Dedicated Protected Areas3 and any other areas of ecological and social significance identified by the community during the community-based land use planning processes with the Province of Ontario (e.g., Enhanced Management Areas; see Section 6.1 for requirements related to confidentiality); – lands subject to conservation agreements; – current mineral development proposals, and areas of early and advanced mineral exploration in the study areas; – current areas of aggregate extraction; – description and locations of all potable drinking water sources (i.e., municipal or private), including spring water sources; – description of local communities and Indigenous groups that is culturally relevant and gender sensitive; – if the information is not confidential, provide a description and location of Indigenous traditional territories and/or consultation areas, Treaty and/or Title lands, Indian Reserve lands, Indigenous harvesting regions (with permission of Indigenous groups), Métis settlements; and – culturally important features of the landscape.	■ The information requested will be provided in the IS / EA Report, if applicable.	■ No Reference, will be addressed in IS / EA Report.
3	TISG Section 3.1, page 11	■ The Impact Statement must describe all project components including but not limited to: – borrow pits, gravel or aggregate pits and quarries (footprint, geographic location, ownership, and development plans including pit phases and lifespan), including their location in relation to upland habitats and the presence of rare, limited and/or significant habitat (e.g., federal, provincial, or Indigenous protected and conserved areas, ANSIs (Areas of Natural and Scientific Interest), Ramsar sites, critical habitat identified under the Species at Risk Act, etc.;	■ The information requested will be provided in the IS / EA Report, if applicable.	■ Section 6.2 ■ Section 8 (including subsections)
4	TISG Section 5.1, page 22	■ Any proposed mitigation measures are to be clearly linked, to the extent possible, to valued components in the Impact Statement as well as to specific project components or activities, as well as comments raised during engagement activities	■ Once potential effects have been identified, the effects assessment will explore technically and economically feasible mitigation measures to avoid or minimize the identified negative effects and enhancement measures to increase positive effects.	■ Section 9.5

ID#	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
5	TISG Section 7.1, page 29	■ In describing the biophysical environment, the Impact Statement must take an ecosystem approach that considers how the Project may affect the structure and functioning of biotic and abiotic components with the ecosystem using scientific, community and Indigenous knowledge regarding ecosystem health and integrity, as applicable. The Impact Statement must provide a description of the indicators and measures used to determine ecosystem health and integrity, identified during early planning and reflected in the TISG. The presence of habitat (e.g., federal, provincial, or Indigenous protected areas, ANSIs, RAMSAR sites, critical habitat identified under the Species at Risk Act, etc.), such as but not limited to spawning shoals, aquatic vegetation or overwintering pools, potentially effected by the Project should be included in the description of the biophysical baseline conditions.	■ We will take an ecosystem approach that considers how the project may affect structure and functioning of biotic and abiotic ecosystem components and the potential residual effects as a result of these changes. This includes areas of indigenous cultural importance, descriptions of ecosystem health and integrity, the presence of protected areas and critical habitat for SAR species.	■ Section 9.2
6	TISG Section 7.1, page 30	■ The Impact Statement must consider the resilience of relevant species populations, communities and associated habitats to the effects of the Project. Ecological processes should be evaluated for potential susceptibility to adverse effects from the Project. Considerations include patterns and connectivity of habitat patches; continuation of key natural disturbance regimes; structural complexity; hydrogeological or oceanographic patterns; nutrient cycling; abiotic-biotic and biotic interactions; population dynamics, genetic diversity, Indigenous knowledge relevant for the conservation and sustainable use of relevant species populations, communities and associated habitats.	■ The IA / EA will consider the resilience of relevant populations, communities and associated habitat to the effects of the Project. Ecological processes will be evaluated for potential susceptibility to adverse effects from the Project such as considerations for patterns and connectivity of habitat patches and continuation of key natural disturbance regimes.	■ Section 9.4.2
7	TISG Section 7.1, page 30	■ The Impact Statement must establish appropriate study area boundaries to describe the baseline conditions. The study area boundaries need to encompass the spatial boundaries of the Project, including any associated project components or activities, and the anticipated boundaries of the Project effects, including all potentially impacted local communities, municipalities and Indigenous groups. Considerations in assigning appropriate study areas or boundaries would include, but not be limited to: – areas potentially effected by changes to water quality and quantity or changes in flow in the watershed and hydrologically connected waters; – areas potentially effected by airborne emissions or odours; – areas determined by dispersion and deposition modelling; – areas within the range of vision, light and sound and the locations and characteristics of the most sensitive receptors; – species habitat areas, usage timing and migratory patterns; – emergency planning and emergency response zones; – the geographic extent of local and regional services; – any impacted local communities, including municipalities; – all potentially impacted Indigenous groups; – areas of known Indigenous land, cultural, spiritual and resource use; and – existing effected infrastructure.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6.2
8	TISG Section 7.1, page 30	■ If the baseline data have been extrapolated or otherwise manipulated to depict environmental, health, social and/or economic conditions within the study area, modelling methods must be described and must include assumptions, calculations of margins of error and other relevant statistical information. Models that are developed should be validated using field data from the appropriate local and regional study areas. Ensure baseline data is representative of project site conditions. If surrogate data from reference sites are used rather than site-specific surveys, the proponent should demonstrate that the data are representative of project site conditions.	■ We will include details on modeling methods and discuss confidence in using desktop and/or field studies when describing baseline conditions in the IS / EA Report.	■ Section 7 ■ Section 8 ■ Section 9.4
9	TISG Section 7.1, page 31	■ Where baseline data are available in geographic information system (GIS) format, this information is to be provided to the Agency as electronic geospatial data file(s) compliant with the ISO 19115 standard19. This would support the Government of Canada's commitment to Open Science and Data and would facilitate the sharing of information with the public through the Canadian Impact Assessment Registry Internet Site and the Government's Open Science and Data Platform. The Agency intends to make the geospatial data files available to the public under the terms of the Open Government License – Canada20.	■ Data provided will meet ISO 19115 standards.	■ Section 8.6

ID#	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
10	TISG Section 7.2, pages 31-33	■ Information sources and data collection methods used for describing the baseline environmental, health, social and economic setting may consist of the following sources of information. For specific sources of baseline information, see Appendix 1. – Federal government (e.g., Environment and Climate Change Canada, Health Canada, Indigenous Services Canada, Statistics Canada, Women and Gender Equality Canada); – Ontario provincial government (e.g., Ministry of Environment, Conservation, and Parks, Ministry of Natural Resources and Forestry; – Bird Conservation Region plans21; – academic institutions; – field studies, including site-specific survey methods; – database searches, including: – federal, provincial, territorial, municipal and local data banks; – Breeding Bird Atlas - Ontario (2001-2005)22 – monitoring program databases protected areas, watershed or coastal management plans; – natural resource management plans; – species recovery and restoration plans; – field measurements to gather data on ambient or background levels for air, water, soil and sediment quality, light levels or acoustic environment (soundscape); – land cover data, including: • terrestrial ecosystem mapping products; • forest cover maps; • remote sensing resources; • important habitats and features to include: ▪ water bodies, wetlands, watercourses; ▪ riparian habitat; ▪ river banks or other eroded habitats; ▪ artificial water sources; ▪ forest, tree patches, solitary trees (especially old decaying trees); ▪ forest edges and tree rows; ▪ ridges, including eskers; ▪ caves and mines; ▪ cliffs, rock outcrops, exposed bedrock, talus, and other karst topography; ▪ buildings, bridges, and other anthropogenic features, including linear features; ▪ sources of artificial lighting attracting insects; ▪ critical habitat; and ▪ and any other habitat features known to be important in the area. – published literature, such as peer reviewed journals, reports by think tanks, non-government organizations and government reports; – environmental assessment documentation, including monitoring reports, from prior projects in the area and similar projects outside the area; – regional studies, project assessments and strategic assessments; – renewable harvest data; – Indigenous knowledge, including oral histories and knowledge gathered by spending time on the land with knowledge holders; – community based monitoring and studies conducted by Indigenous communities; – expert, community, public and Indigenous engagement and consultation activities, including workshops, meetings, open houses, surveys;	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Section 7 (including subsections) ■ Appendix A

ID#	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
		– qualitative information gathered from interviews, focus groups or observation; – census data; – baseline human health risk assessments; – community and regional economic profiles; – community well-being studies; and – statistical surveys, as applicable.		
11	TISG Section 7.2, page 32	■ The Impact Statement must provide detailed descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental, health, social and economic condition that is described, in order to corroborate the validity and accuracy of the baseline information collected.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7 (including subsections) ■ Appendix A
12	TISG Section 7.2, page 33	■ Data directly relevant to the area surrounding the Project are limited. With the exception of existing count data that have been collected within the regional study area, the use of existing information sources should be limited to the goals of estimating the species likely to occur in the study areas, and to identifying the potential timing of migration passage (for species that migrate through) or the general dates of breeding (for species that breed in the area).	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Section 7 (including subsections);
13	TISG Section 7.2, page 33	■ Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to.	■ We will include details on modeling methods and discuss confidence in using desktop and / or field studies when describing baseline conditions.	■ Section 7 (including subsections) ■ Section 9.4 (including subsections).
14	TISG Section 7.2, page 33	■ If using existing data sources, the Impact Statement must provide justification to show that the data sources are relevant in spatial and temporal coverage to the Project. Some data sources may have good coverage in Southern Ontario or existing road networks but be unsuitable as a baseline for these northern areas where there are not roads.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Section 7.1
15	TISG Section 7.2, page 33	■ With regard to field studies, survey work must be planned to include multiple sampling locations and multiple visits to each location to support all required assessment analyses. Existing data should be considered as a limited augmentation of this new data. See the “Establishing Baseline Conditions” (sections 8.5, 8.9, 8.10, 8.11) in this Tailored Impact Statement Guidelines for recommendations on survey design and methodology. Surveys and analyses should be conducted by qualified experts. Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to.	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7 (including subsections) ■ Section 9.4 (including subsections)
16	TISG Section 7.2, page 33	■ Consult the Species at Risk Public Registry for information on the list of species at risk and available recovery documents and reference the documents and dates consulted. Ensure the most up to date documents are used and species statuses are up to date23	■ The information requested will be provided in the IS / EA Report.	■ Section 8.5
17	TISG Section 7.3, page 34	■ The list of valued components must be informed, validated and finalized through engagement with the public, Indigenous groups, lifecycle regulators, jurisdictions, federal authorities, and other interested parties. The Impact Statement must describe valued components, processes, and interactions that are identified to be of concern or that the Agency considers likely to be impacted by the Project and are included in the Guidelines.	■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in **Section 4** of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with MECP and the Agency once available.	■ Section 4

ID#	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
18	TISG Section 7.3, pages 34-35	■ In selecting a valued component to be included, the following factors should be considered: – valued component presence in the study area; " – the extent to which the valued component is linked to the interests or exercise of Aboriginal and Treaty rights of Indigenous peoples, and whether an Indigenous group has requested the valued component; – the extent to which the effects (real or perceived) of the Project and related activities have the potential to interact with the valued component; – the extent to which the valued component may be under cumulative stress from other past, existing or future undertakings in combination with other human activities and natural processes; – the extent to which the valued component is linked to federal, provincial, territorial or municipal government priorities (e.g., legislation, programs, policies); – the extent to which the valued component is being addressed through any ongoing or completed regional assessment processes; – the possibility that adverse or positive effects on the valued component would be of particular concern to Indigenous groups, the public, or federal, provincial, territorial, municipal or Indigenous governments; and – whether the potential effects of the Project on the valued component can be measured and/or monitored or would be better ascertained through the analysis of a proxy valued component.	■ The IS / EA Report will include detailed descriptions of the VCs and the rationale for their inclusion to describe their importance and the predicted residual effects (adverse and positive) as a result of the project.	■ Section 1.2
19	TISG Section 7.3, page 35	■ The valued components must be described in sufficient detail to allow the reviewer to understand their importance and to assess the potential adverse and positive environmental, health, social and economic effects and impacts arising from the Project activities.	■ The IS / EA Report will include detailed descriptions of the VCs and the rationale for their inclusion to describe their importance and the predicted residual effects (adverse and positive) as a result of the Project.	■ Table 1-2 ■ Table 2-1 ■ Section 9 (including subsections)
19	TISG Section 7.4.1, pages 35-36	■ The Impact Statement must describe the spatial boundaries, including project, local and regional study areas, for each valued component included in assessing the potential adverse and positive environmental, health, social and economic effects of the Project and provide a rationale for each boundary. Spatial boundaries are defined taking into account the appropriate scale and spatial extent of potential effects and impacts of the Project; community knowledge and Indigenous knowledge; current or traditional land and resource use by Indigenous groups; exercise of Aboriginal and Treaty rights of Indigenous peoples, including cultural and spiritual practices; and physical, ecological, technical, social, health, economic and cultural considerations. The size, nature and location of past, present and foreseeable future projects and activities are factors that should be included in the definition of spatial boundaries. It should be noted that in some cases, spatial boundaries might extend to areas outside of Canada. These transboundary spatial boundaries should be identified where transboundary effects are expected.	■ The Study Areas are defined and described in the Study Plan. ■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in Section 4 of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with MECP and the Agency once available.	■ Section 4 ■ Section 6.2
20	TISG Section 7.3, page 35	■ For each of the valued components that will be assessed in the Impact Statement, the proponent must create a study plan and a work plan to be validated by the Agency. Upon receipt of a study plan, the Agency may request that the proponent present and discuss the study plan at technical meetings, which will be scheduled during the impact statement phase.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in **Section 3** of the Study Plan.	■ Section 3
20	TISG Section 7.4.1, page 36	■ For biophysical valued components, spatial boundaries should be defined using an ecosystem-centered approach for the project study area, local study area, and regional study area, as wetlands and eskers are features that are likely to be most effected. Ecoregion boundaries or their derivatives should not be used since the Project occurs on, near and across ecoregion boundaries. See Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 for more guidance on determining spatial boundaries. Delineate spatial boundaries (i.e., regional study area, local study area, and project study area) to meet the following objectives: a. range of land cover types should be representative of the defined spatial extent; b. the spatial pattern of the land cover types should be well distributed across the defined spatial extent (e.g., revise if one or more land cover types is concentrated in one sub-area and uncommon in other parts of the area); and c. low to moderate rate of change in the prevalence of one or more land cover types with increasing distance from the (i.e., to use land cover patterns to constrain the distances within which comparisons should be made).	■ The Study Areas are defined and described in the Study Plan.	■ Section 6.2 ■ Table 6-1

ID#	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
21	TISG Section 7.4.1, page 36	■ For valued components establish three study area spatial boundaries to assess impacts to each valued component: 1) Project Study Area: defined as the project footprint for each alternative route; " 2) Local Study Area: defined for each valued component – see below; 3) Regional Study Area: defined for each valued component – see below ■ Provide a rationale for boundaries of the project study area, local study area, and regional study area for each valued component and indicate how the above objectives were met in establishing the boundaries.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6.2
22	TISG Section 7.4.1, page 37	■ For Habitat valued components: The spatial extent of the habitat and the habitat functions should influence the determination of an appropriate local study area and regional study area, considering objectives a-c above. The local study area should be at a minimum: project study area plus a 500-metre buffer. For habitat valued components potentially affected by the Project, a land cover analysis should be conducted to determine if a 500-metre buffer appropriately reflects ecological boundaries.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6.2 ■ Table 6-1
23	TISG Section 7.4.1, page 37	■ For Species valued components: The local study area should correspond to the project study area plus a buffer defined with objectives a-c above. Use simulation modeling to help define a buffer that captures objectives a-c for each species or species group.	■ The Study Areas are defined and described in the Study Plan.	■ Section 6.2 ■ Table 6-1
24	TISG Section 7.4.1, page 37	■ Contact provincial and/or local government authorities to verify appropriate boundaries for wildlife species. Guidance for specific species of interest have been listed below: – for wolverine, the local study area should be at a minimum: project study area plus a 10- kilometre buffer. Simulation modeling may indicate a larger buffer; – for bats, the local study area should be at a minimum: project study area plus a 1-kilometre buffer. Simulation modelling may indicate a larger buffer; and – for caribou, the local study area should be at a minimum: project study area plus a 10-40-kilometre buffer. Simulation modeling may indicate a larger buffer. In addition to assessing project and cumulative effects at the scale of the three study areas defined above, also assess at the scale of the implicated Ontario caribou ranges (Missisa, Nipigon and Pagwachuan), and the federal Far North caribou range. "	■ The Study Areas are defined and described in the Study Plan. ■ Cumulative effects assessment will be conducted as part of the IA / EA. The scale of effects assessment for caribou will be the PDA, LSA, RSA and with reference to / qualitatively at the scale of the federal Far North range. ■ A summary of technical discussions with regulators is provided in the updated Study Plan.	■ Section 3 ■ Section 6.2
25	TISG Section 7.4.2, page 37	■ The temporal boundaries of the impact assessment span all phases of the Project determined to be within the impact assessment. If potential effects are predicted after project decommissioning or abandonment, this should be taken into consideration in defining specific boundaries. In order to assess a project's contribution to sustainability, consideration should be given to the long-term effects on the well-being of present and future generations. When defining temporal boundaries, the proponent should consider how elements of environmental, health, social and economic well-being that local communities, including municipalities, and Indigenous groups identify as being valuable could change over time.	■ The Study Areas are defined and described in the Study Plan. ■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in **Section 4** of the Study Plan; further details can be found in the *IS / EA Consultation Plan* included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with MECP and the Agency once available.	■ Section 4 ■ Section 6 ■ Table 9-1 ■ Section 9.7
26	TISG Section 8.10, page 58	■ For the species identified above, describe and quantify the habitat type, including its function; location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and; abundance as it existed before project construction;	■ The background review as it pertains to wildlife in particular will focus on identifying, delineating, and classifying known wildlife habitats, as well as identifying potential rare species, SAR, and species of Indigenous importance that may be present within the Study Areas.	■ Section 7 (including subsections)
27	TISG Section 8.10, page 58	■ The Impact Statement must describe any locations within the study area that might constitute sensitive areas for terrestrial wildlife such as: species at risk critical habitat that has been designated or is under consideration, ecological reserves and protected areas, in proximity to the project location or that could be effected by routine project operations or any lands in the study area that might constitute sensitive areas and habitat for wildlife, or nearby environmentally significant areas such as; National Parks, areas of natural or scientific interest, National Wildlife Areas, World Biosphere Reserves or UNESCO Natural World Heritage Sites;	■ The information requested will be provided in the IS / EA Report.	■ Section 7.2 ■ Section 8.3.3 ■ Section 8.3.4 ■ Section 8.5 ■ Section 9.4.2
28	TISG Section 8.10, page 58	■ The Impact Statement must describe the use and harvesting of fur-bearing species and whether its harvesting has Indigenous cultural importance;	■ This information will be collected as described in the Land and Resource Use Study Plan. ■ The historic and current use of ungulates as a source of country foods (traditional foods) and where use has Indigenous cultural importance will be described.	■ Section 4 ■ Land and Resource Use Plan

ID#	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
29	TISG Section 8.10, page 58	■ The Impact Statement must describe the historic and current use of terrestrial wildlife as a source of country foods (traditional foods) or where use has Indigenous cultural importance (e.g., black bear, caribou, deer, moose, beaver, arctic fox, fisher, wolverine, rabbits, marten, muskrat, and otter);	■ This information will be collected as described in the Land and Resource Use Study Plan. ■ The historic and current use of ungulates as a source of country foods (traditional foods) and where use has Indigenous cultural importance will be described.	■ Section 4 ■ Land and Resource Use Plan
30	TISG Section 8.10, page 58	■ The Impact Statement must describe the levels of disturbance currently affecting wildlife and wildlife habitat, such as habitat fragmentation and the extent of human access and use.	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3.1 ■ Section 8.3.3 ■ Section 9.4.1.2 ■ Section 9.4.2
31	TISG Section 8.10, page 58	■ The Impact Statement must identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline biodiversity for terrestrial wildlife and discuss the rationale for their selection;	■ Indicators have been identified based on background information, consultation with regulatory agencies, public and indigenous consultation.	■ Section 9.2
32	TISG Section 8.10, page 58	■ The Impact Statement must identify wildlife management areas and established or proposed sanctuaries; and	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3.1 ■ Section 8.3.3
33	TISG Section 8.10, page 58	■ The Impact Statement must identify wildlife species, other than avian species, of ecological, economic or human importance (particularly to Indigenous peoples), within the study area (including moose, rabbit, beavers, otters, muskrat, and frogs), that are likely to be directly or indirectly effected and describe each species: – biodiversity, distribution and location; – abundance and population status; – life cycle; – seasonal ranges, migration and movements; – sensitive periods (e.g., seasonal, diurnal and nocturnal); – habitat requirements; and	■ The IA / EA will identify wildlife species that are likely to be directly or indirectly effected and will describe each species': – biodiversity, distribution, and location. – abundance and population status. – life cycle. – seasonal ranges, migration, and movements. – habitat requirements; and – sensitive periods (e.g., seasonal, diurnal, and nocturnal). ■ In addition, wildlife habitat type, including its: function; location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and abundance as it existed before project construction will be described. ■ The historic and current use of wildlife as a source of country foods (traditional foods) and where use has Indigenous cultural importance will be described.	■ Section 7.2.2 ■ Section 7.2.3
34	TISG Section 8.10, page 58	■ The Impact Statement must provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3.3 ■ Section 8.3.4
35	TISG Section 8.10, page 58	■ The Ministry of Environment, Conservation and Parks may be able to provide information on specific data sources and survey methodologies. Collect wildlife data to represent the following temporal sources of variation: – among years – Within and among seasons (e.g., spring dispersal, breeding, late summer/fall migration and swarming, hibernation); and – Within the 24-hour daily cycle. Rare species require more survey effort to detect than common species, and this needs to be accounted for in survey design by increasing the number and duration of surveys.	■ Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e. among years, among seasons and within 24 periods).	■ Section 7
36	TISG Section 8.10, page 59	■ The Impact Statement must provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation);	■ The information requested will be provided in the IS / EA Report.	■ Section 8.6
37	TISG Section 8.10, page 59	■ The Impact Statement must submit complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards39;	■ The information requested will be provided in the IS / EA Report. Data provided will meet ISO 19115 standards.	■ Section 8.6
38	TISG Section 8.11, page 60	■ Collect species at risk data to represent the following temporal sources of variation: – among years; – within and among seasons (e.g., spring dispersal, breeding, late summer/fall migration and swarming, hibernation); and – within the 24 hour daily cycle.	■ Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e. among years, among seasons and within 24 periods).	■ Section 7 (including subsections)

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39	TISG Section 8.11, page 60	■ The Impact Statement must [identify] key habitat associated with species at risk should be considered valued components, including eskers and similar geologic features, wetlands and peatlands;	■ SAR and Significant Wildlife Habitat will be considered in the IS / EA Report.	■ Section 7 ■ Section 8
40	TISG Section 8.11, page 60	■ The Impact Statement must: – provide a list of all provincially listed protected species at risk and species assessed by the COSEWIC that have the status of extirpated, endangered, threatened or of special concern and that may be directly or indirectly effected by the Project. Use existing data and literature as well as surveys to provide current field data that reflects the natural inter-annual and seasonal variability;	■ The information requested will be provided in the IS / EA Report. ■ Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e. among years, among seasons and within 24 periods).	■ Section 2.1.2 ■ Section 8.5
41	TISG Section 8.11, page 60	■ Provide a list of all species at risk listed under Schedule 1 of the federal Species at Risk Act that may be directly or indirectly effected by the Project. Use existing data and literature as well as surveys to provide current field data that reflects the natural inter-annual and seasonal variability of each species. Species at risk which may inhabit the project area include: – Lake sturgeon (*Acipenser fulvescens*); – Northern Myotis (*Myotis septentrionali*); – Little Brown Myotis (*Myotis lucifugus*); – Caribou (*Rangifer tarandus*; Provincial: Missisa, Nipigon, and Pagwachuan ranges; Federal: Far North range); – Rusty Blackbird (*Euphagus carolinus*); – Bank Swallow (*Riparia riparia*); – Barn Swallow (*Hirundo rustica*); – Canada Warbler (*Cardellina canadensi*); – Chimney Swift (*Chaetura pelagica*); – Common Nighthawk (*Chordeiles mino*); – Eastern Whip-poor-will (*Antrostomus vociferu*); – Evening Grosbeak (*Coccothraustes vespertinus*); – Olive-sided fly-catcher (*Contopus cooperi*); – Peregrine Falcon (*Falco peregrinus*); – Short-eared Owl (*Asio flammeus*); – Yellow Rail (*Coturnicops noveboracensis*); and – Wolverine (*Gulo gulo*);	■ The information requested will be provided in the IS / EA Report. ■ Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e. among years, among seasons and within 24 periods).	■ Section 8.5
42	TISG Section 8.11, page 60	■ The Impact Statement must provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3.3 ■ Section 8.3.4
43	TISG Section 8.11, page 61	■ Account for the fact that rare species will require more survey effort to detect, which should be reflected in survey design by increasing the number and duration of surveys: – collect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is being suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability; – Sample size must be planned to support a robust evaluation of the project study area within the context of the local study area and regional study area; – Design of surveys will need to consider multiple number of survey locations in order to represent the habitat heterogeneity of the regional study area, and to plan the number of survey locations per land cover or habitat class so that aggregation of habitat classes post-hoc is not required; – In terms of sampling effort per unit area, field survey effort should be most intensive within the project study area. The level of effort per unit area may be similar or somewhat less within the remainder of the local study area but should be scaled to the likelihood that project effects will impact species at risk within that zone. Efforts outside the project study area should be carefully designed to ensure that estimates comparing and across the project study area, local study area and regional study area are unbiased and precise; – A habitat-stratified random sampling approach should be used. Sample sites should be selected with a randomization procedure such as a GIS grid overlay; and	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in **Section 3** of the Study Plan. ■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IS / EA Report and are summarized in this Study Plan.	■ Section 6.2 ■ Section 8.5

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		– Where Critical Habitat has not been defined or has been partially identified, a Schedule of Studies may have been created to identify gaps in information for these species. The Schedule of Studies information should be referred to when implementing or assessing survey protocols, in order to provide necessary information for these species.		
44	TISG Section 8.11, page 61	■ Contain complete data sets from all survey sites. These should be in the form of complete and quality assured relational databases, with precisely georeferenced site information, precise observation/visit information and with observations and measurements in un-summarized form. Databases and GIS files should be accompanied by detailed metadata that meets ISO 19115 standards;	■ The information requested will be provided in the IS / EA Report. ■ Data provided will meet ISO 19115 standards.	■ Section 8.6
45	TISG Section 8.11, page 61	■ Ensure that, at minimum, the combined information from existing data and field surveys must be able to describe the distribution and abundance of species at risk in relation to the study areas;	■ The combined information from existing data and field surveys will describe the distribution and abundance of SAR in relation to the study areas.	■ Section 7.2.1 ■ Section 7.2.3 ■ Section 8.2 ■ Section 8.5
46	TISG Section 8.11, page 61	– provide documentation and digital files for all results of analyses that allow for a clear understanding of the methods and a replication of the results (raw scripts or workflows are preferred in place of descriptive documentation);	■ The information requested will be provided in the IS / EA Report.	■ Section 8.6
47	TISG Section 8.11, pages 61-62	■ Follow the survey requirements specific to bats: – to augment existing information sources and collect data able to robustly establish baseline conditions and assess impacts, undertake site-specific surveys to: • Quantify baseline bat activity to evaluate relative use of different habitats or features in the project area and to help support and evaluate project siting decisions and impact predictions. • Document baseline conditions within the project Area and Local Assessment Area to support study of impacts. • Identify potential regional migration corridors; and • Identify site-specific travel corridors and movement patterns. – the following types of surveys are required: • acoustic surveys, ensure study design is statistically valid, conducted in spring, summer, and fall to capture dispersal and migration (travel corridors), breeding, and roosting; • locate and assess potential hibernacula and roosts for use by bats, accounting for inter-annual and within-season variability in use. This could be done using desktop habitat suitability modelling with field surveys to confirm presence in high potential areas; and • Refer to provincial recommendations for guidelines on survey methodology.	■ Desktop reviews will be completed to identify commuting / migration corridors that may exist within the Study Area. This habitat suitability exercise will inform the locations of the acoustic surveys which will be designed to locate and identify high value habitat features such as maternity roosts, foraging areas, and hibernacula. Data will be collected though desktop studies, aerial investigations, and acoustic monitoring.	■ Section 7.2.1 (including subsections)
48	TISG Section 8.11, pages 62-63	■ Data or reports must include information on acoustic detection methods used, including the following: – detector make and model; – microphone model used; – location of Detectors; – height of microphones; – orientation of microphones; – special housing that may effect microphone sensitivity (e.g., wind screen, cones, weatherproofing, etc.); – mounting method (e.g., meteorological tower, pole, etc.); – device specific settings (e.g., gain/sensitivity, TBC, etc.); – recording mode (i.e., full spectrum or zero-crossing); and – a summary of any issues with equipment failure, and a description of procedures used to ensure equipment was operational during deployment (including ensuring microphone sensitivity remains within an acceptable range).	■ The following details will be collected and included in the survey methodology for bats: – detector make and model; – microphone model used; – location of ARU; – height of microphones; – orientation of microphones; – special housing that may affect microphone sensitivity (e.g., wind screen, cones, weatherproofing, etc.); – mounting method (e.g., meteorological tower, pole, etc.); – device specific settings (e.g., gain / sensitivity, TBC, etc.); – recording mode (i.e., full spectrum or zero-crossing); – directional orientation and surrounding habitat features; and – photographs taken in each cardinal direction from the location of each ARU. ■ A summary of any issues with equipment failure will be noted.	■ Section 7.2.1.2.3

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49	TISG Section 8.11, page 62	– the following types of surveys are required: • acoustic surveys, ensure study design is statistically valid, conducted in spring, summer, and fall to capture dispersal and migration (travel corridors), breeding, and roosting; • locate and assess potential hibernacula and roosts for use by bats, accounting for inter-annual and within-season variability in use. This could be done using desktop habitat suitability modelling with field surveys to confirm presence in high potential areas; and • Refer to provincial recommendations for guidelines on survey methodology.	■ Desktop reviews will be completed to identify commuting / migration corridors that may exist within the Study Area. This habitat suitability exercise will inform the locations of the acoustic surveys which will be designed to locate and identify high potential habitat features such as maternity roosts, foraging areas, and hibernacula. Surveys will take place during the late spring / summer (June 1-June 30) roosting period as well as the fall swarming period (August 1-September 30). Data will be collected though desktop studies, aerial investigations, and acoustic monitoring.	■ Section 7.2.1.1
50	TISG Section 8.11, page 63	■ In relation to studies for bats: note that study design, analysis of acoustic data and interpretation of results would require the services of a bat expert;	■ Acoustic survey locations and finalizations of the study design, along with analysis and interpretation of data using software, will be completed by bat experts.	■ Section 7.2.1.2.2 ■ Section 8.1
51	TISG Section 8.11, page 63	■ In relation to surveys for bats: Where results are compared across years, timing of surveys compared, equipment and setup protocols must remain consistent across years.	■ Equipment and setup protocols will remain consistent across years where possible.	■ Section 7.2.1.2.3
52	TISG Section 8.11, page 63	■ In relation to surveys for bats: Clearly describe methods used for acoustic identification, including any validation procedures used, criteria used for deciding on species classifications, and software used (including versions and settings)	■ The information requested will be provided in the IS / EA Report.	■ Section 8.1
53	TISG Section 8.11, page 63	■ In relation to surveys for bats: Clearly describes methods used to define a bat “pass” and be consistent with the definition used for any comparison group. Provide a rationale for the chosen method;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.1
54	TISG Section 8.11, page 64	■ Provide data and summary lists for each species at risk ranked according to: – abundance; – Distribution across survey sites (i.e., percentage of survey stations at which they were recorded); – Abundance in each habitat type; and – Map showing areas of highest concentrations or areas of use by species. ■ Data must be supplemented by surveys, as required;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.5
55	TISG Section 8.11, page 64	■ For the species identified: – provide any published studies that describe the regional importance, abundance and distribution of species at risk, including recovery strategies or plans; " – consult relevant published studies that describe suitable survey methodologies for caribou and wolverine based on winter track observations including but not limited to: • caribou resource selection probability functions describing the probability of resource use at the range scale (see Hornseth & Rempel 2016); • caribou, moose, and wolf occupancy models describing their distribution in the far north (see Poley et al. 2014); and • wolverine occupancy models describing the distribution of wolverine in the far north (see Ray et al. 2018). – provide data and summary lists for each species at risk ranked according to: • abundance; " • distribution across survey sites (i.e., percentage of survey stations at which they were recorded); • abundance in each habitat type; and • map showing areas of highest concentrations or areas of use by species. – data must be supplemented by surveys, as required; – survey protocols should optimize detectability and survey effort should provide for comprehensive coverage at the appropriate time of year (e.g., survey breeding habitat during breeding season, stopover habitat during migration); – survey protocols should provide a rationale for the scope of and the methodology used for surveys including design, sampling protocols and data manipulation; and – where using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications and indicate who was consulted in the development of the baseline surveys (e.g., federal/provincial wildlife experts, specialists and local Indigenous groups).	■ The information requested will be provided in the IS / EA Report.	■ Section 7 (including subsections ■ Section 8 (including subsections ■ Section 9.4.1.1

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56	TISG Section 8.11, page 64	■ For the species identified: – provide any published studies that describe the regional importance, abundance and distribution of species at risk, including recovery strategies or plans; " – consult relevant published studies that describe suitable survey methodologies for caribou and wolverine based on winter track observations including but not limited to: • caribou resource selection probability functions describing the probability of resource use at the range scale (see Hornseth & Rempel 2016); • caribou, moose, and wolf occupancy models describing their distribution in the far north (see Poley et al. 2014); and • wolverine occupancy models describing the distribution of wolverine in the far north (see Ray et al. 2018). – provide data and summary lists for each species at risk ranked according to: • abundance; " • distribution across survey sites (i.e., percentage of survey stations at which they were recorded); • abundance in each habitat type; and • map showing areas of highest concentrations or areas of use by species. – data must be supplemented by surveys, as required; – survey protocols should optimize detectability and survey effort should provide for comprehensive coverage at the appropriate time of year (e.g., survey breeding habitat during breeding season, stopover habitat during migration); – survey protocols should provide a rationale for the scope of and the methodology used for surveys including design, sampling protocols and data manipulation; and – where using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications and indicate who was consulted in the development of the baseline surveys (e.g., federal/provincial wildlife experts, specialists and local Indigenous groups).	■ Descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental condition will be provided in the IA / EA and are summarized in this Study Plan.	■ Section 7 (including subsections) ■ Section 8 (including subsections) ■ Section 9.4.1.1
57	TISG Section 8.11, page 64	■ Consult relevant published studies that describe suitable survey methodologies for caribou and wolverine based on winter track observations including but not limited to: – Caribou, moose, and wolf occupancy models describing their distribution in the far north (see Poley et al. 2014); and – Wolverine occupancy models describing the distribution of wolverine in the far north (see Ray et al. 2018).	■ The information requested will be provided in the IS / EA Report.	■ Section 7.2 (including subsections) ■ Section 8.3.4 ■ Section 8.3.5 ■ Section 8.5 ■ Section 9.4.1.1
58	TISG Section 8.11, page 65	■ Provide information and/or mapping at an appropriate scale (The project study area and local study area, as defined above for each valued component, constitute the appropriate scale) for residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified or proposed Critical Habitat and/or recovery habitat (where applicable). Describe the general life history of species at risk (e.g., breeding, foraging) that may occur in the project area, or be affected by the Project;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3.3 ■ Section 8.3.4 ■ Section 8.5 ■ Section 9.4.2
59	TISG Section 8.11, page 65	■ - Identify and map all species at risk, critical habitat, and residences on federal land within the project study area and local study area (provincial and/or local government authorities should be contacted to determine any additional data sources and survey methodologies)	■ The information requested will be provided in the IS / EA Report.	■ Section 8.5
60	TISG Section 8.11, page 65	■ Provide information and/or mapping at an appropriate scale (The project study area and local study area, as defined above for each valued component, constitute the appropriate scale) for residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified or proposed Critical Habitat and/or recovery habitat (where applicable). Describe the general life history of species at risk (e.g., breeding, foraging) that may occur in the project area, or be affected by the Project	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3.3 ■ Section 8.3.4 ■ Section 8.5 ■ Section 9.4.2
61	TISG Section 8.11, page 65	■ Survey protocols should optimize detectability and survey effort should provide for comprehensive coverage at the appropriate time of year (e.g., survey breeding habitat during breeding season, stopover habitat during migration);	■ Seasonal-specific survey protocols are described in IS / EA Report and will be provided in the IA / EA	■ Section 7.2

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62	TISG Section 8.11, page 65	■ The project study area and local study area, as defined above for each valued component, constitutes the appropriate scale.	■ The Study Areas are defined and described in the Study Plan.	■ Table 6-1
63	TISG Section 8.11, page 65	– where using recognized standards, provide details of any modifications to the recommended methods and rationale for these modifications and indicate who was consulted in the development of the baseline surveys (e.g., federal/provincial wildlife experts, specialists and local Indigenous groups).	■ The information requested will be provided in the IS / EA Report.	■ Section 7.2 ■ Section 8
64	TISG Section 8.11, page 65	■ In relation to providing required information for bats, the Impact statement must: – quantify baseline bat activity (e.g., using acoustic detection to calculate an index of bat activity) to evaluate relative use of different habitats or features in the project area to help support and evaluate project siting decisions or impact predictions. In addition, locate and confirm use of high-value features such as roosts, foraging areas and hibernacula.	■ Background studies and field surveys will quantify baseline bat activity with the goal of evaluating habitat use which will inform Project siting decisions and assess impacts.	■ Section 7.2.1
65	TISG Section 8.5, page 42	■ The Impact Statement must provide data files of mapped features depicting natural areas and wildlife presence within, and use of, the study area;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3.3 ■ Section 8.3.4 ■ Section 8.5 ■ Section 8.6 ■ Section 9.4.2
66	TISG Section 8.5, page 42	■ The Impact Statement must provide written description and maps of ecozones, ecoregions, and ecodistricts as per Ontario or Canada's Ecological Landscape Classification;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.3.3 ■ Section 8.3.4
67	TISG Section 13, pages 80-83	■ This section of the TISG describes the methodology for the effects assessment, including definitions of scope, severity, and irreversibility.	■ The IS / EA Report will include a description of the methodology of the effects assessment and definition of magnitude, some of which is also summarized in this Study Plan.	■ Section 9 (including subsections)
68	TISG Section 14.1, page 86	■ The IA must describe the locations and characteristics of the most sensitive receptors including species at risk and differential effects for sensitive receptors.	■ Data will be gathered as outlined in the Acoustic and Vibration Environment Study Plan. Locations and characteristics of sensitive receptors as they pertain to wildlife will be addressed in the IA / EA.	■ Section 7.2 ■ Acoustic Environment VC Study Plan
69	TISG Section 14.3, Page 88	■ The Impact Statement must provide an overall description of changes related to landscape disturbance including fragmentation of habitats and project effects on areas of ground instability;	■ The direct, incidental, and cumulative predicted positive and/or adverse effects of the Project on the Wildlife VCs will be predicted based on anticipated changes to habitat availability, fragmentation, ground instability, and species abundance, as well as individual effects, will be provided in the IA / EA.	■ Section 9.4.2
70	TISG Section 14.3, page 89	– describe the methodology used to identify effects;	■ Methodology related to effects assessment has been provided in the Study Plan.	■ Section 9 (including subsections)
71	TISG Section 15.3, page 94	■ The Impact Statement must describe changes to insects, pollinating species in particular;	■ A desktop review will be completed to describe potential changes to insects with emphasis on pollinating insects.	■ Section 7.2.4 ■ Section 8.4 ■ Section 9.2 ■ Table 9-2
72	TISG Section 15.3, page 94	■ The Impact Statement must describe changes to key habitat, including eskers and similar geologic features, wetlands and peatlands, for species important to current use of lands and resources for traditional purposes;	■ Particular attention will be paid to critical habitat and habitat of species important to current use of lands and resources for traditional purposes.	■ Section 9.4.2
73	TISG Section 15.3, page 94	■ The Impact Statement must describe the potential adverse effects of the Project on wildlife as a result of poaching;	■ Increased poaching and recreational resource use opportunities will be examined in the IA / EA.	■ Section 9.4.2 ■ Land and Resource Use Study Plan
74	TISG Section 15.3, page 94	■ The Impact Statement must describe the potential direct, incidental and cumulative adverse effects to other wildlife and wildlife habitat, including population level effects that could be caused by all project activities, including but not limited to: project noise and sensory disturbances, habitat alteration, air emissions and dust, increased predation, increased potential for spread of disease, invasive species introductions, poaching opportunities, any linear access corridors (roads, rights of way) particularly in the vicinity of wetland (including peatlands), lake and riparian habitats and on migratory corridors;	■ The direct, incidental, and cumulative predicted positive and/or adverse effects of the Project on the Wildlife VCs will be predicted based on anticipated changes to habitat availability, fragmentation, and species abundance.	■ Section 9.4.2

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75	TISG Section 15.3, page 94	■ The Impact Statement must describe effects to terrestrial wildlife biodiversity considering biodiversity metrics, effects of habitat fragmentation, changes to regional biodiversity	■ This Study Plan will consider the effects of the Project on the Wildlife VCs considering: – Spatial distribution; – Frequency of occurrence; – Patterns of occurrence and abundance in time; – Habitat fragmentation; – Abundance and, if possible, density; and Associate habitat types and strength of associations.	■ Section 9.4.2
76	TISG Section 15.3, page 94	■ The Impact Statement must describe the potential adverse effects of the Project on species noted as important to Indigenous groups and local communities and their habitat that are not currently listed under the Species at Risk Act or provincial statutes;	■ This information will be collected as described in the Land and Resource Use Study Plan. ■ The historic and current use of ungulates as a source of country foods (traditional foods) and where use has Indigenous cultural importance will be described.	■ Section 9.2 ■ Land and Resource Use Study Plan
77	TISG Section 15.3, page 94	■ The Impact Statement must provide an evaluation of the effects of any new road access or rights of way on wildlife mortality risk and movement patterns;	■ An evaluation of the effects of new road access on wildlife mortality is described in **Table 2-1** and will be provided in the IA / EA.	■ Table 2-1 ■ Section 9.4.2
78	TISG Section 15.3, page 94	■ In addition to direction from Environment and Climate Change Canada via the Agency, the Ontario Ministry of Environment, Conservation and Parks and the Ministry of Natural Resources and Forestry should be considered a source of information on appropriate methodologies to predict effects to wildlife.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Section 7.1 ■ Appendix A
79	TISG Section 15.4, page 100	– provide an account of how the project and mitigation measures are consistent with the recovery strategy, action plan, or management plan for the species.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9.4.2
80	TISG Section 15.4, page 95	■ In relation to describing effects on bats, the Impact Statement must: – take into account any effects to foraging habitats as well as hibernacula, roosts and travel corridors when assessing effects to local and regional populations; and – identify potential roosts, hibernacula, foraging habitat and travel corridors in the local area and determine whether the Project will impact these habitats or their functions as bat habitat. Where artificial roost structures (i.e., buildings) are rare in the landscape, particular attention should be paid to identifying natural roost structures;	■ Roosts, foraging habitat, and travel corridors will be assessed through desktop studies, and aerial and acoustic monitoring. ■ No suitable hibernacula were observed in 2019. However, if known or potentially suitable hibernacula are identified during the desktop review, and / or the aerial surveys conducted for the Project, then appropriate field surveys to confirm their presence will occur.	■ Section 7.2.1 (including subsections)
81	TISG Section 15.4, page 95	■ The Impact Statement must: – describe the potential direct, incidental and cumulative adverse effects of the project on species at risk listed under Schedule 1 of the Species at Risk Act and, where applicable, its critical habitat (including its extent, availability and presence of biophysical attributes); – analyses predicted effects for each species at risk. To fully understand the effects and/or benefits of one alternative versus another, all relevant metrics and evaluators for species at risk should be considered; – include separate analyses for each project activity, component, and phase; – consider potential effects to species at risk from bioaccumulation and biomagnification of contaminants of dust and other pollutants resulting from the project; and conduct post-construction surveys to verify predicted effects. – conduct post-construction surveys to verify predicted effects.	■ Effects to SAR will consider potential direct, incidental, and cumulative adverse effects of the Project on SAR and, where applicable, its critical habitat Predicted effects for each SAR will be analyzed and addressed in the IA / EA. ■ Each project activity, component, and phase will be analyzed separately in the IA / EA. ■ A thorough list of impact management measures including offsetting and compensation as necessary that will be employed by the Project will be included in the IA / EA.	■ Section 9.4.2 ■ Table 9-1
82	TISG Section 15.4, Page 95	– analyses predicted effects for each species at risk. To fully understand the effects and/or benefits of one alternative versus another, all relevant metrics and evaluators for species at risk should be considered;	■ Predicted effects for each SAR will be analyzed and addressed in the IA / EA.	■ Section 9.2 ■ Table 9-2
83	TISG Section 15.4, Page 95	– include separate analyses for each project activity, component, and phase;	■ Each project activity, component, and phase will be analyzed separately in the IA / EA.	■ Section 9.1
84	TISG Section 15.4, Page 95	– consider potential effects to species at risk from bioaccumulation and biomagnification of contaminants of dust and other pollutants resulting from the project; and conduct post-construction surveys to verify predicted effects.	■ All potential effects to SAR including from pollutants will be discussed, and follow-up programs such as post-construction monitoring will be included in the IA / EA.	■ Section 9.3 ■ Section 9.10

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85	TISG Section 15.4, page 99	– demonstrate that avoidance and minimization measures will be applied for species at risk. Recovery Strategies will provide information such as Population and Distribution Objectives, and Strategic Direction for Recovery;	■ Published studies that describe the regional importance, abundance, and distribution of SAR, including recovery strategies and plans will be used. The IS / EA Report will describe all feasible measures to eliminate, avoid or minimize the effects of the Project on SAR and their habitats, including critical habitats.	■ Section 9.4.2
86	TISG Section 15.4, page 99	– clearly identify the locations of federal lands/non-federal lands within the study area and differentiate between these land tenures in the presentation of information regarding all species at risk. For example, total habitat disturbance for boreal caribou should be presented at the range scale, but it should also be presented in a way that clearly indicates habitat disturbance specifically within federal lands;	■ The information requested will be provided in the IS / EA Report.	■ Section 9.4.2
87	TISG Section 15.4, page 99	– describe all feasible measures that will be taken to avoid or lessen the impact of the Project on the species and its critical habitat;	■ Mitigation measures will be informed by best management practices, applicable resource management and/or recovery plan, Indigenous input, and industry standards.	■ Section 9.5 ■ Section 9.4.2
88	TISG Section 15.4, page 99	– describe all reasonable alternatives to the Project that would avoid the potential effects on species and their habitat, with particular attention to critical habitat, and important habitats such as upland habitat which is used as movement corridors by caribou, breeding areas for birds, and which contains roosting habitat for bats;	■ Reasonable alternatives to the Project will be evaluated by several criteria, which may include SAR, and will be included in the EA / IA.	■ Section 9.4.2
89	TISG Section 15.4, page 99	■ Describe the area, biophysical attributes and location of habitat including critical habitat affected (e.g., destroyed, permanently altered, disrupted); describe all feasible measures that would be taken to eliminate the effects of the work or activity on species and their habitats, including critical habitat; and	■ The IS / EA Report will describe the biophysical attributes and locations of habitat, as well as all feasible measures to eliminate, avoid or minimize the effects of the Project on SAR and their habitats, including critical habitats.	■ Section 9.4.2
90	TISG Section 15.4, page 99	– describe the effects of construction pits and quarries on or near esker deposits on species at risk;	■ The effects of construction pits and quarries on or near esker deposits on SAR will be discussed in the IS / EA Report.	■ Section 9.4.2
91	TISG Section 15.4, page 99	– describe the potential adverse effects of the Project on species protected by provincial statutes and assessed by the COSEWIC as extirpated, endangered, threatened or of special concern (flora and fauna) and their habitat that are not currently listed under the Species at Risk Act;	■ Potential effects on species protected by provincial statutes and assessed by COSEWIC will be described thoroughly along with those listed under SARA in the IA / EA.	■ Table 2-1 ■ Section 9.4.2
92	TISG Section 15.4, page 99	– identify critical timing windows (e.g., denning, rutting, spawning, calving, breeding, roosting), setback distances, or other restrictions related to these species;	■ Critical timing windows (e.g., denning, breeding, roosting), setback distances, or other restrictions that will be imposed or followed will be considered in assessing predicted effects.	■ Section 9.4.2
93	TISG Section 15.4, page 99	– identify provincial, territorial or federal permits or authorizations that may be required in relation to the species at risk;	■ Provincial or federal permits or authorizations in relation to SAR that may be required will be identified in the IA / EA.	■ Section 9.4.2
94	TISG Section 15.4, page 99	– provide survey results and detailed mapping of each species at risk and their habitat, including important habitat features, for all federal lands;	■ The information requested will be provided in the IS / EA Report.	■ Section 8.5 ■ Section 9.4.2
95	TISG Section 15.4, page 99	– describe the residual effects that are likely to result from the project after avoidance and minimization measures have been applied, including the extent, duration and magnitude of the effects on: • the number of individuals killed, harmed, harassed; and • the number of residences damaged or destroyed.	■ Residual effects will be described in terms of the magnitude, geographic extent, timing, duration, frequency, social and ecological context, likelihood, and whether effects are reversible or irreversible. They will be described by: – the number of individuals killed, harmed, harassed; – the number of residences damaged or destroyed; and – the area, biophysical attributes and location of habitat including critical habitat affected.	■ Section 9.4.2 ■ Section 9.6
96	TISG Section 17.6, Page 110	■ The Impact Statement must assess potential impacts to surrounding communities, including local Indigenous communities. The spatial and temporal boundaries for the assessment should be determined with the input from the community based on pre-contact in consideration of aspects that are relevant to the community's understanding of their culture. The Impact Statement must assess changes to: – culturally significant plants or wildlife.	■ This information will be collected as described in the Land and Resource Use Study Plan. ■ The historic and current use of ungulates as a source of country foods (traditional foods) and where use has Indigenous cultural importance will be described.	■ Section 9.5 ■ Land and Resource Use Study Plan
97	TISG Section 20, page 119-128	■ Section 20 of the TISG describes the requirements around mitigation and enhancement measures that must be considered in the Impact Statement.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9.5

ID#	Federal TISG Reference	Requirement / Comment / Concern	Response	Study Plan Reference
98	TISG Section 20, Page 120	– in relation to bats, mitigation measures should be developed in collaboration with federal authorities and included in the Impact Statement. In addition, the following mitigation measures should be considered by the proponent: • follow decontamination protocols for White-nose Syndrome by the Canadian Wildlife Health Cooperative71; and • apply appropriate mitigation measures, such as timing windows and setbacks, to all areas with potential roosting habitat, unless each structure is individually assessed and verified to not be used for roosting.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9.5
99	TISG Section 20, Page 123	■ In relation to bats, mitigation measures should be developed in collaboration with federal authorities and included in the Impact Statement. In addition, the following mitigation measures should be considered by the proponent: – at a minimum, the following mitigation should be applied: • spatial avoidance (setbacks): ▪ 120 metre is recommended; and ▪ for tree roosts, apply setbacks to the entire maternity roost complex and for hibernacula apply setback to entire underground cave/mine network. • Temporal avoidance (timing of disturbance, roost destruction or exclusion): ▪ avoid disturbance, destruction and exclusion between April 30 – September 1. • Manage vegetation at bridges and other commuting corridors that intersect highways: ▪ include bat monitoring at bridges, close to significant habitat features (e.g., roosts, hibernacula, significant foraging habitats) and identified bat commuting corridor locations to estimate mortality. Where mortality is higher than background rates, compensation measures are required to reduce mortality. ▪ manage vegetation height and tree canopy height so that it is not in line with the height of traffic; and ▪ Lighting: • Avoid or minimize the use of artificial light in bat habitats; • Select lower intensity lighting; • Use lighting fixtures that restrict or focus illumination to target areas; and • Avoid lights that emit blue/green/white/UV wavelengths.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9.5
100	TISG Section 21, pages 129-130	■ Section 21 of the TISG describes the requirements and guidance associated with determining residual effects.	■ Residual effects will be assessed in the IA / EA.	■ Section 9.6
101	TISG Section 22, pages 131-133	■ Section 22 of the TISG describes the guidance around conducting cumulative effects assessment for the project.	■ Cumulative effects assessment will be conducted as part of the IA / EA.	■ Section 9
102	TISG Section 26, Page 141	■ Section 26 of the TISG includes a description of the considerations for developing a follow-up program for environmental, health, social or economic effects, as applicable.	■ Monitoring programs will be identified as part of the IA / EA.	■ Section 9.10

Table 11-2: Study Plan Provincial Concordance – Conformance with Requirements

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
1	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ For each potential impact to species at risk or their habitat, measures will have to be identified to first avoid any adverse effects and in cases where there are no practical or feasible alternatives, identify measures that minimize or mitigate the adverse effects. Such measures may be general, site-specific, or activity-specific in nature. For caribou, the province has developed Best Management Practices (BMPs) for some sectors to provide guidance to avoid, minimize or mitigate adverse effects to the species and their habitat. Where possible, it is always preferential to avoid, given that if any adverse impacts exist, the associated activities would require authorization under the ESA.	■ The IS / EA Report will identify suitable impact management measures to avoid or minimize potential effects of the Project, including potential effects on SAR.	■ Section 9
2	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ In addition to land use policy, any resource management direction for the study area including forest management plans and fisheries management plans/objectives should be reviewed and considered	■ Applicable resource management plans will be reviewed and considered in the IA / EA.	■ Section 7 ■ Appendix A
3	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ The proposed all-season road will enable access to areas that previously have been essentially inaccessible to mechanized travel except during the winter. The creation of new access can result in impacts on fish and wildlife populations (e.g., due to new or increased hunting pressure), “remoteness” and remote or “wilderness” recreation / tourism experiences, among other effects. The MNRF will consider the effects of creating new access when making decisions to issue authorizations under legislation administered by MNRF.	■ Effects to wildlife and fish populations from the creation of new access and recreational opportunities will be considered in the IA / EA. Additional information can be found in the Land and Resource Use Study Plan.	■ Section 9 ■ Land and Resource Use Study Plan
4	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ Refer to the MNRF’s “Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (a.k.a. the Stand and Site Guide) for stand and site level direction that could be applied during planning and construction activities.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Draft ToR ■ Appendix A ■ Section 9
5	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ There are numerous trap line areas within or adjacent to the proposed road corridor alternatives, and trap cabins associated with these lines may be located close to or within the alternative corridors. Marten Falls should consult with trap line holders and provide information regarding potential impacts to trapping and trapline holders and proposed measure to avoid or minimize these impacts. In addition to traplines, other commercial resource users within and adjacent to the alternatives include Bear Management Area Operators, Baitfish License Holders and Resource-based Tourism operators.	■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in **Section 4** of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with the MECP and the Agency once available.	■ Draft EA ■ Section 7.2.3 ■ Section 8.3.1.
6	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ Project documentation will need to consider the direction within the Ogoki FMP regarding forestry activities, wildlife objectives and access, and address how the proposed project may impact those activities and objectives. There is also the need to consider the impacts to Kenogami Forest with respect to existing roads and the associated use management and responsibility.	■ Mitigation measures will be informed by best management practices, applicable resource management and/or recovery plan, Indigenous input, and industry standards.	■ Draft ToR
7	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ There are likely a number of species that are considered provincially rare which occur within and adjacent to the proposed road corridor. The MNRF encourages using the best conservation measures available to protect these species.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Section 9
8	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ The project proposal and other documentation will need to identify these natural heritage features and fully consider potential impacts to and mitigation for the respective features.	■ Mitigation measures will be informed by best management practices, applicable resource management and / or recovery plan, Indigenous input, and industry standards.	■ Draft ToR ■ Section 9
9	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ Project planning should consider the potential introduction and establishment of invasive species via construction and use of the road, impacts that could result, and measures that will be taken to avoid or minimize their spread and resultant negative environmental effects.	■ Mitigation measures to limit the spread and/or introduction of invasive species will be provided in the IA / EA.	■ Section 9.5
10	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ In the identification of alternative methods, the Environmental Assessment should document consideration of methods including an assessment of potential impacts to species at risk and their respective habitats and identify methods that can avoid or minimize potential impacts to individuals of the species and all categories or protected habitat to the extent possible.	■ The information requested will be provided in the IS / EA Report, if applicable.	■ Draft ToR

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
11	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ Study areas are missing and lack clarity – maps show study area for 4 routes even though only 2 (or 1?) routes are proposed to be assessed; no indication of local and regional study areas for each environmental component (e.g. ground water, surface water, caribou, etc.).	■ The study areas are defined and described in the Study Plan.	■ Section 6
12	MECP	■ Completeness Review Memorandum compiled from MECP emails and August 2019 meetings with MECP and ENDM	■ MECP recommends that the EA contain commitments to monitoring to verify the expected effects of the proposed undertaking on species at risk and their habitat and to determine if additional impact mitigation measures or adjustments to any measures are required. Monitoring methodology for these species and their habitat should be included in the monitoring plan developed as part of the EA. If impact management measures are proposed, monitoring of the effectiveness of these measures should be included in the monitoring plan. The monitoring plan should include steps the proponent will take if impact management measures are not effective (e.g. application of additional impact management measures, changing how and where the activity will be performed, etc.).	■ The IS / EA Report will include a monitoring framework for the Preferred Route to verify the prediction of effects and the effectiveness of the impact management measures implemented, including those related to SAR and their habitat. These plan(s) will identify the compliance and effects monitoring activities to be undertaken during all phases of the Project, as required.	■ Section 9
13	MECP	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #17 Section 8 Page 54 – Consultation on Assessment Methodology - MFFN acknowledges that the proposed methodology will be open to input during the draft ToR review, but also says a more detailed method will be presented in the EA. Page 47 indicates the effects assessment criteria will be developed during the EA. While it is appropriate to defer some detailed work planning to the EA phase, the ToR should include commitments for how technical reviewers, and other interested persons, will be consulted during the development of specific evaluation methodologies or technical work plans. It is strongly recommended that those opportunities for review occur prior to the completion of studies (e.g. prior to the submission of a draft or final EA document).It is not clear whether MFFN plans to consult on the more detailed methodology and criteria during the EA phase or if the ToR phase is the main opportunity to provide input. – Please indicate how consultation on the ToR has informed the preliminary criteria and indicators. Please clarify when MFFN will consult and provide opportunity for input on the detailed assessment method, including criteria and indicators (and work plans as MECP has proposed), with agencies, communities and stakeholders during the EA phase in order to finalize the methodologies before EA studies get advanced.	■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in Section 4 of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with MECP and the Agency once available. ■ A summary of technical discussions with agencies is provided in the Study Plan.	■ Section 4 ■ Section 5
14	MECP	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #21 Section 10.2.4 Page 73 – Technical Work Plans - Page 73 states that MECP has indicated it will not be commenting on work plans associated with field work until the ToR is finalized. This statement does not reflect MECP's guidance to the project team. MECP's guidance, which is documented on page 69 of the RoC, is that the ToR is the mechanism to seek technical review of work plans and that discipline- specific work plans should be included with the ToR. As well, discussions that MECP has had with the project team to date are considered pre-consultation, since it is the ToR that sets out what work is to be done during the EA phase. – Please revise the statement on page 73 to state: "MFFN provided MECP and MNRF work plans associated with field work planned during 2019 for review, however MECP advised this is considered-consultation and that discipline-specific work plans should be appended to the ToR to allow full technical review. "As the draft ToR did not include detailed discipline-specific work plans, the other option the ministry strongly recommends is to include commitments to develop workplans at the outset of the EA phase, including opportunities for technical review.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in **Section 3** of the Study Plan.	■ Section 3

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
15	MECP	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental, MECP Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Assessment Methods – For the most part, section 7.2 provides a description of potential environmental effects for each discipline. However this section also includes assessment methodologies for some subsections (7.2.1 and 7.2.2 AERMOD modelling, quantitative noise assessment) while the majority do not (7.2.3 – 12). The level of detail in the ToR about assessment methods should be consistent for all environmental components. – It is strongly recommended to include commitments to develop work plans at the outset of the EA phase, including opportunities for technical review by agencies and others. The work plans should include assessment methodology appropriate for each environmental component. The ToR could include a high level summary table for each environmental discipline listing data collection and assessment methods, with a commitment to develop the work plans at the outset of the EA phase to provide more details. Consider where the information about air and noise modelling is best placed.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in **Section 3** of the Study Plan.	■ Section 3
16	MECP	■ Email from Agni Papageorgiou & Sasha McLeod, Special Project Officer Environmental, MECP Assessment Services Section, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #16 Section 8 Page 54 – Work Plans - Section 8 describes the approach that will be taken to evaluate alternative methods during the EA, including proposed criteria and indicators (presented in Appendix A). The information presented is high level and does not provide an opportunity for technical review of the methodologies that will be applied to evaluate those specific criteria and indicators. – It is strongly recommended to include commitments to develop work plans at the outset of the EA phase, including opportunities for technical review by agencies and others.	■ The Study Plan meets this requirement. A summary of the Technical discussions with agencies have been summarized in **Section 3** of the Study Plan.	■ Section 3
17	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #22 Appendix A – Ungulates – Wildlife – Potential Data Sources / pg. 2 – Additional published sources of information should be included for all SAR: • Policy Guidance on Harm and Harass under the Endangered Species Act (2014) • Categorizing and Protecting Habitat under the Endangered Species Act (2012) • Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits (2012) • Wolverine Government Response Statement (2016) • Wolverine Recovery Strategy (2013) • Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario – Ontario Recovery Strategy Series (2019) – Update the draft ToR to include additional data sources.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Appendix A
18	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Recommendation to prevent delays should ESA authorization be required. It is strongly recommended that the project be planned, and the environmental assessment prepared, with the requirements of the Endangered Species Act, 2007 (ESA) in mind. This can potentially facilitate the authorization process under the ESA, where authorization is required. In order to inform any future ESA authorization requirements, reasonable route / project alternatives should be assessed for impacts to all species at risk and their respective habitats, and at least one avoidance alternative should be included. Please refer to the MECP "Avoidance Alternatives Form" for activities that may require an overall benefit permit under clause 17(2)(c) of the Endangered Species Act" and accompanying guide for reference. (http: / /www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/MinistryResults?Openform&SRT=T&MAX=5&ENV=WWE&STR=1&TAB=PROFILE&MIN=018&BRN=21&PRG=31)	■ The requirements of the ESA process were considered in the development of this Study Plan.	■ Section 7 ■ Section 9

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
19	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.7.1.4.9 / pg. 32 – Based on the information provided in this section, it is unclear what data collection has already been conducted versus what data collection will be conducted during the development of the EA for SAR. For example, it is unclear whether the information provided on page 32 for the Bat maternity Roost Monitoring and Bird Surveys have already occurred or are being planned. If they have already occurred, additional information on the methodology, survey extent, dates, etc. is required. Further, there is no mention of the 2018 Winter aerial caribou survey conducted by Zoetica, as mentioned in the Response to MFFN. – Request for Information dated 2019-07-30, or any of the field work proposed in the Technical Memorandum provide to MECP on June 6, 2019 which outlined the planned breeding bird point count surveys, marsh bird call back surveys, bank swallow and barn swallow visual habitat assessments, Eastern Whip-poor-will surveys, Bat Maternity Roost Monitoring Surveys, Remote Camera Surveys, Vegetation Surveys, and Aerial Reconnaissance Survey. All previous field work related to SAR should be identified and summarized in the Draft ToR. This will assist in determining whether additional SAR surveys are required (i.e., to identify occupancy, distribution, etc.). Specifically for Caribou, Winter Aerial Surveys, Summer Calving Survey, Telemetry Studies and (to a more limited extent) Camera Trap Surveys each provide valuable information that can provide inform on baseline conditions and impacts. Refuge from predation is the ultimate factor influencing caribou distribution and habitat use in the Boreal forest. One of the key threats to caribou is habitat fragmentation due to development activities, particularly those that increase and / or introduce linear features to the landscape. These types of disturbances increase predator efficiency which may have a detrimental effect on caribou populations within the LSA and RSA. Understanding how caribou respond to habitat fragmentation and increased predator access will be an important aspect to assessing the impacts of the Project. Particularly, the deployment of radio satellite collars on caribou within proximity of the alternative corridors under consideration (e.g., LSA), that would enable tracking of caribou before / during / after construction, provides important baseline information and contributes towards assessing impacts of the Project on caribou habitat movement and habitat selection / use within proximity to new linear features. Update the draft ToR to clearly identify any data collection (i.e., surveys) for SAR that have already been conducted. In each case, provide survey methodology, dates, etc. Update the draft ToR to clearly identify any data collection that will be conducted for SAR during the development of the EA (i.e., data collection and monitoring work plan). Include a brief description of the data collection methodology that will be used. This should include details for surveys and methods MFFN is committing to carry out during the EA, including, but not limited to, the following: • Caribou (e.g. aerial / ground surveys, telemetry study, camera traps, etc.) • Wolverine (e.g. telemetry study, hair traps, camera traps, etc.) • Northern Myotis and Little Brown Myotis (e.g. bat hibernaculum screening, bat maternity roost habitat assessments, bat acoustic surveys, etc.) • Bank Swallow (e.g., nesting surveys, etc.) • Barn Swallow (e.g., nesting surveys, etc.) • Eastern Whip-poor-will (e.g., habitat assessments, breeding surveys, etc.)	■ Information about field studies conducted to date, as part of this program are summarized in the Study Plan. Additional information on Caribou can be found in the Ungulates Study Plan. Results from these field studies will be provided at a later date.	■ Section 7 (including all subsections)

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
20	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Additional information should be provided, in table format, for each SAR that have the potential to occur in the area of the Project, including, but not limited to: – Scientific name – Common name – Species Status under SARA (Federal) – Species Status under ESA (Provincial) – Conservation Ranking (i.e., N-Rank, S- Rank) – Information Source(s) used to identify potential occurrence within the area of the Project – Indication of whether a field survey(s) has been conducted already to identify species presence and, if so, whether or not it was observed – General list of habitat requirements – Indication of whether the required habitat exists within the Study Area (i.e., as per comment 5, should include Project Footprint, Local Study Area and Regional Study Area) Update the draft ToR to include additional information for each SAR that have the potential to occur in the area of the Project.	■ The information requested will be provided in the IS / EA Report.	■ No reference
21	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.7.1.4.7 pg 30 – File surveys conducted in Spring" – will the results from this be included in the ToR or in the EA? A Work plan should be committed to in the ToR for field work to be completed and where necessary should be designed to target specific Species at Risk. MECP would like to advise on survey methodology. This will make sure that the proponent does not apply efforts that are not required or likewise they will not miss aspects that will require repeated effort.	■ This Study Plan has been designed to target SAR and will be provided to the MECP for their review.	■ Section 7.2 ■ Section 7.2.1 ■ Section 7.2.3
22	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ Field survey conducted in Spring – Spring would not be the advised time to survey bat maternity roosting. MECP can advise on surveys necessary and the survey protocol for SAR bat species.	■ Surveys are proposed to take place for at least 10 days during the maternity roosting period of June 1 to June 30. The MECP guidance will be followed for the SAR bat survey protocols.	■ Section 7.2.1.2.3
23	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.7.1.4.9 / pg. 32 – Follow the survey requirements specific to bats: • to augment existing information sources and collect data able to robustly establish baseline conditions and assess impacts, undertake site-specific surveys to: · compile a species inventory (species present/not detected);	■ Bat species inventory surveys (presence / not detected) will be conducted using ARUs to improve our understanding of natural variability in bat relative abundance within and among seasons.	■ Section 7.2.1
24	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.7.1.4.9 / pg. 32 – Locate and confirm use of high value habitat features such as roosts (including cavity trees and buildings with potential for roosting) and hibernacula. This could be done using desktop habitat suitability modelling with field surveys to confirm presence in high potential areas.	■ Roosting structures within the PDA and LSA were identified through a desktop habitat suitability modeling exercise utilizing the criteria outlined in the Study Plan. Field surveys followed to confirm bat habitat presence in high potential areas in 2019. Additional surveys, if necessary, will be conducted in a similar fashion.	■ Section 7.2.1

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
25	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.7.1.4.9 / pg. 32 – Bat maternity roost monitoring – acoustic monitoring. The study design is not outlined so it is difficult to comment on if the study was satisfactory for identification of SAR bats and their habitat.	■ The acoustic monitoring and roost monitoring study designs are explained in this Study Plan and will be further outlined in the future work plan.	■ Section 7.2.1.2
26	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.7.1.4.9 / pg. 32 – Submit the acoustic monitoring design and data collected for review and further advice.	■ The information requested will be provided in the IS / EA Report.	■ Section 8.6
27	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.7.1.4.9 / pg. 32 – The following types of surveys are required: - acoustic surveys, ensure study design is statistically valid, conducted in spring, summer, and fall to capture dispersal and migration (travel corridors), - breeding, - and roosting;	■ Data (desktop and field-based) will be collected to represent temporal sources of species variation (i.e. among years, among seasons and within 24 periods).	■ Section 7.2.1
28	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.5.2.2 / pg. 13 – If ESA authorization is required, project details including location and extent of infrastructure (e.g., road, temporary access roads, laydown areas, etc.) will need to be identified prior to permitting to ensure complete assessment of impacts to SAR.	■ Study Plan **Section 6.2** indicates that the Project Development Area (PDA) encompasses the 100 metre-wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, and long-term aggregate sources and associated access roads. The specific location of Project components, including the roadway, pits and quarries, aggregate source areas and temporary infrastructure, are not yet known and will be included in the IS / EA Report.	■ Section 6.2
29	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ s.7.1.1 / pg. 19 – The draft ToR limits the Study Area to only a 5 km width (2.5 km on either side of the ROW). This limited extent is inappropriate to assess the impacts to SAR that use broad landscapes, specifically Caribou (Boreal population) and Wolverine. Multiple spatial extents need to be considered as part of the Study Area (e.g., Project Footprint, Local Study Area, Regional Study Area) to appropriately consider and assess impacts of the Project to SAR. It is recommended that 20 km (10 km on either side of the ROW) be used to define the Local Study Area to make sure all potential impacts to Caribou sub-range habitat features (e.g., category 1 habitat such as nursery areas and winter use areas) are considered. This aligns with provincial policy direction (i.e., General Habitat Description for the Forest-dwelling Woodland Caribou (Rangifer tarandus caribou) (2013) (GHD)) and best management practices for caribou. Further, the range-level direction provided in the GHD, Range Management Policy in Support of Woodland Caribou Conservation and Recovery (2014) (RMP) and Ontario's Woodland Caribou Conservation Plan (CCP) needs to be considered, which acknowledges impacted range(s) be used to define the Regional Study Area. Update section 7.1.1 and Figure 6-1 in ToR to identify the Study Area at multiple spatial scales, including Project Footprint, Local Study Area and Regional Study Area. Update information provided in section 7 of ToR to reflect the updated Study Area in the Existing Environment and Potential Environmental Effects.	■ The study areas are defined and described in the Study Plan.	■ Section 6.2

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
30	MECP	■ Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist – Species at Risk Branch – Permissions & Compliance, Email from the Ministry of the Environment, Conservation and Parks with comments of the Draft ToR, received on 24-Jan-2020	■ #7 s.7.1.1 / pg. 19 – The draft ToR limits the Study Area to only a 5 km width (2.5 km on either side of the ROW). This limited extent is inappropriate to assess the impacts to SAR that use broad landscapes, specifically Caribou (Boreal population) and Wolverine. – Multiple spatial extents need to be considered as part of the Study Area (e.g., Project Footprint, Local Study Area, Regional Study Area) to appropriately consider and assess impacts of the Project to SAR. – Update section 7.1.1 and Figure 6-1 in ToR to identify the Study Area at multiple spatial scales, including Project Footprint, Local Study Area and Regional Study Area. Update information provided in section 7 of ToR to reflect the updated Study Area in the Existing Environment and Potential Environmental Effects.	■ The study areas are defined and described in the Study Plan.	■ Section 6.2
31	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #13 s.7.1.4.9 / pg. 32 – Bat maternity roost monitoring – acoustic monitoring. The study design is not outlined so it is difficult to comment on if the study was satisfactory for identification of SAR bats and their habitat. Submit the acoustic monitoring design and data collected for review and further advice.	■ Bat acoustic monitoring study design is described in detail in the Study Plan.	■ Section 7.2.2.2.2
32	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #14 s.7.1.4.9 / pg. 32 – Habitat types that may support part of the life cycle for Species at Risk bats should be considered (e.g., hibernacula, foraging habitat, general roosting, swarming). – Mapping of potential habitat for SAR bats should be carried out (desktop exercise). MECP advises the use of geological mapping to identify areas of potential hibernacula. In the desktop analyses as well as information pertaining to abandoned mines or mapped hibernacula. After this analysis is done, MECP can advise if any field investigations might be required and can provide survey methodologies.	■ The approach to identifying SAR bat habitat is outlined in the Study Plan.	■ Section 7.2.1.1
33	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #15 s.7.1.4.9 / pg. 32 – Mention of Wolverine being present but there is no mention of field surveys that will be carried out for this species. – Outline of study methodology for wolverine should be in work plan e.g. aerial surveys, telemetry study, hair traps, camera traps, etc.	■ The study design for Wolverine has been added to the Study Plan.	■ Section 7.2.3
34	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #18 Table 7-4 / s. 7.2 / pg. 47 and s.7.2.9 / pg. 52 – Preliminary consideration of potential effects to SAR needs to be included, above and beyond those applicable to vegetation (s.7.2.6), wildlife (s.7.27) and fish and fish habitat (s.7.2.8). – Both Table 7-4 and s.7.2.9 are lacking any information specific to SAR (e.g., increased mortality risk to caribou resulting from predator efficiencies related to additional linear features, increase in predator/prey populations, etc.). – This should include a preliminary list of potential effects, in a table format, including, but not limited to, the following: • Project Component or Activity ○ Field surveys, staking, layout ○ Vegetation clearing and grubbing ○ Construction of supportive infrastructure (e.g. storage and laydown yards, temporary access roads, construction camps, aggregate extraction areas)	■ Impacts on SAR by individual Project activities will be described in detail in the IS / EA Report.	■ Section 9.4.2

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
			○ Construction of the road ○ Aggregate extraction and production ○ Emissions, discharge and waste ○ Operations and maintenance • Potential Effects • Mitigation Measures – Update the draft ToR to include additional information for preliminary potential effects of the Project components specific to SAR.		
35	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ The Draft ToR indicates that MFFN provided MECP and MNRF work plans associated with field work planned during 2019 for review, but that the agencies indicated they will not be commenting on work plans until the ToR is finalized. ■ As per comment ID#174, MECP SARB is seeking a data collection and monitoring work plan to be included in the ToR outlining the data collection methodology that will be conducted for SAR during the development of the EA to inform baseline and environmental effects to SAR. Update the draft ToR to clearly identify any data collection that will be conducted for SAR during the development of the EA (i.e., data collection and monitoring work plan). Include a brief description of the data collection methodology that will be used. This should include details for surveys and methods MFFN is committing to carry out during the EA, including, but not limited to, the following: • Caribou (e.g. aerial / ground surveys, telemetry study, camera traps, etc.) • Wolverine (e.g. telemetry study, hair traps, camera traps, etc.) • Northern Myotis and Little Brown Myotis (e.g. bat hibernaculum screening, bat maternity roost habitat assessments, bat acoustic surveys, etc.) • Bank Swallow (e.g., nesting surveys, etc.) • Barn Swallow (e.g., nesting surveys, etc.) • Eastern Whip-poor-will (e.g., habitat assessments, breeding surveys, etc.)	■ The updated Study Plan will be reviewed by relevant federal and provincial agencies.	■ No reference
36	MECP	■ Email from Kevin Green, Species at Risk Recovery Biologist; Michelle Karam, Management Biologist; Nikki Boucher, A/Species at Risk Specialist - Species at Risk Branch – Permissions & Compliance, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ #22 Appendix A – Ungulates – Wildlife – Potential Data Sources / pg. 2 – Additional published sources of information should be included for all SAR: • Policy Guidance on Harm and Harass under the Endangered Species Act (2014) • Categorizing and Protecting Habitat under the Endangered Species Act (2012) • Endangered Species Act Submission Standards for Activity Review and 17(2)(c) Overall Benefit Permits (2012) • Wolverine Government Response Statement (2016) • Wolverine Recovery Strategy (2013) • Little Brown Myotis, Northern Myotis and Tri-colored Bat in Ontario – Ontario Recovery Strategy Series (2019) – Update the draft ToR to include additional data sources.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Appendix A
37	MECP	■ Email from Nikki Boucher, A/Species at Risk Specialist, Permissions and Compliance, Species at Risk Branch, Ministry of the Environment, Conservation and Parks with comments of the Draft ToR	■ We have carried out our review with a view to both the EA and future regulatory authorizations in order to provide you with information that will help enable an efficient approach to project planning and preparation of applications for any necessary Endangered Species Act (ESA) authorizations. Specifically, attention should be paid to the following requirements that form the basis of many of our ESA authorizations: – Minimize adverse effects – you must take reasonable steps to minimize the adverse effects of your activity on the species at risk and their habitat that are likely to be affected by your activity. – Ways to minimize adverse effects of your activity on species at risk & their habitat may include modifying the: • location of the activity	■ The requirements of the ESA process were considered in the development of this Study Plan.	■ Section 9.5

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
			• geographic scale of the potential effects • activity design (e.g. engineering and technological) • timing of the activity • duration and frequency of the effects • approaches and timing for any site restoration or rehabilitation (such as doing progressive rehabilitation while other parts of the activity are still happening) • general operational protocols – Consider reasonable alternatives – you will need to show the Ministry of the Environment, Conservation and Parks that you have considered reasonable alternatives to your activity. – Alternative approaches to your activity include: • Changing the location of the activity • Using alternative methods, equipment or technical designs • Changing the timing of the activity to avoid times when the species is there or is most sensitive to disturbance • Changing the geographic scale, duration and/or frequency of the potential adverse effects • Adding or changing approaches and timing of site restoration or rehabilitation after the activity is done – When considering reasonable alternatives to your activity, you must: • Consider at least one alternative that would completely avoid any adverse effects on species at risk • Identify alternatives that you considered but did not think were reasonable because of biological, technical, social or economic limitations • Explain why the approach you have chosen is the best alternative – In addition, should an Overall Benefit Permit be required for the project, as determined through MECP's review and assessment of all the project details, the following requirement would also need to be considered: ■ Achieve overall benefit – providing an overall benefit to a species means undertaking actions that contribute to improving the circumstances for the species. It must include more than steps to minimize adverse effects on the species or habitats. ■ Achieving an overall benefit to a species may involve providing the species with a range of benefits, such as: – increasing the number of individuals of the species living in the wild and capable of reproducing – increasing the distribution of the species within its natural range – increasing the viability or resilience of existing populations of the species – slowing or reversing population declines by addressing key threats to the species' survival – increasing the quality or amount of habitat for the species ■ Activities such as filling information gaps, education and outreach may contribute to an overall benefit plan for a species at risk. However, alone they are unlikely to meet the overall benefit requirement. ■ Recovery strategies and government response statements, where available provide information that can be used to form plans to achieve an overall benefit for species at risk.		

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
38	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Sec. 7.1.1 (pg. 19), Sec. 7.1.4 (pg. 22), Sec 10.2.4 (pg. 72), Appendix A – ToR indicates that the study area is 2.5 km on each side of the centreline of each alternative route. Given the range of some of the wildlife species, the distance that some fish species will travel to spawn and the potential impacts on remote tourism operations. The study area described may not be adequate to assess the full range of impacts Please provide rationale for the study area. – A data share agreement between the MFFN project team and the Crown is in place. This should be recognized in the ToR and included as a potential data source. Please describe how Crown provided data and data collected for the project will be used and shared amongst organizations. – The ToR should recognize the Crown Data Share Agreement and include reference to it in the listing of potential data sources for the criteria and indicators alternatives evaluation.	■ The study areas are defined and described in the Study Plan. ■ The data share agreement will be recognized in the IA / EA as a data source and is covered in information from the Ontario provincial government in **Appendix A. Preliminary List of Data Sources** for this Study Plan.	■ Section 6 ■ Appendix A
39	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Sec. 5.2 Pg.11 – The Western road corridor alternatives 1 & 4 were chosen to move forward to the EA from the Supplemental Information comparing several alternatives. One of the reasons for relocating away from the existing winter road corridor was access to higher ground (and aggregates). – The higher ground (rock knobs and aggregate) are limiting features in the Far North, and as such possibly provide unique benefits to fish and wildlife. It is recognized that the EA should address concerns related to construction of an all weather road in this northern wetland environment. That said locating the road in higher ground presents concerns related to the limited nature of these features in the northern environment. This is another angle that will need to be evaluated in the EA i.e., the limit of the higher ground and implications towards ecosystems (wildlife, fisheries, etc.).	■ The effects of disturbance or loss of these areas on wildlife and other environmental components will be considered as part of the IA / EA.	■ Draft ToR ■ Section 6.2 ■ Section 9.4.2
40	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Sec. 7.1.1 (pg. 19), Sec. 7.1.4 (pg. 22), Sec 10.2.4 (pg. 72), Appendix A – ToR indicates that the study area is 2.5 km on each side of the centreline of each alternative route. Given the range of some of the wildlife species, the distance that some fish species will travel to spawn and the potential impacts on remote tourism operations. The study area described may not be adequate to assess the full range of impacts Please provide rationale for the study area. A data share agreement between the MFFN project team and the Crown is in place. This should be recognized in the ToR and included as a potential data source. Please describe how Crown provided data and data collected for the project will be used and shared amongst organizations. The ToR should recognize the Crown Data Share Agreement and include reference to it in the listing of potential data sources for the criteria and indicators alternatives evaluation.	■ The study areas are defined and described in the Study Plan. ■ The data share agreement will be recognized in the IA / EA as a data source and is covered in information from the Ontario provincial government in **Appendix A. Preliminary List of Data Sources** for this Study Plan.	■ Section 6 ■ Appendix A
41	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Sec. 7.1.4.9 Pg. 31 – It is recommended a more thorough review is conducted of species that have the potential to be impacted by the proposed undertaking that are listed as Special Concern on the Species at Risk list of Ontario as well as species that are currently only listed under the Species at Risk Act. For consideration in the EA.	■ The information requested will be provided in the IS / EA Report.	■ No reference
42	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Sec. 14 - References 85+ Additional resources from: – Catalogue of natural resource scientific and technical publications. Search a list of the scientific and technical publications issued since 2004 see Catalogue-natural-resource-scientific-and-technical-publications – To request a publication issued by the Ministry of Natural Resources and Forestry, or if you have a question related to MNRF scientific and technical publications, please contact us by email with the title of the publication. For journal articles, please contact the journal publisher directly. – For MNRF climate change publications see MNRF_Climate_Change_Publications – Information about Ontario's species of conservation concern, plant communities, wildlife concentration areas and natural areas see https://www.ontario.ca/page/get-natural-heritage-information	■ Descriptions of specific data sources, data collection, sampling, survey, and research protocols and methods followed for each baseline environmental condition will be provided in the IS / EA Report and are summarized in this Study Plan.	■ Appendix A ■ Section 7

ID#	Comment from Regulatory Agency	Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response	Study Plan Reference
			– Ontario Geohub https://geohub.lio.gov.on.ca/ provides spatial data and mapping applications such as OFAT (Ontario Flow Assessment Tool) that is used to better understand water flow in Ontario.. https://www.ontario.ca/page/watershed-flow-assessment-tool – Some selected publications that may be of interest: • Wester, M.C. et al. 2018. The Ecosystems of Ontario, Part 2: Ecodistricts. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch, Peterborough, ON. Science and Research Technical Report TR-26. 474 p. + appendices Catalogue-natural-resource-scientific-and-technical-publications • Ontario Ministry of Natural Resources and Forestry. 2019. Far North Information Knowledge Management Plan Progress Report 2008-2018. Ontario Ministry of Natural Resources and Forestry, Far North Branch, Peterborough, ON. 80p. contact: farnorthfeedback@ontario.ca • Riley, J. 2011. Wetlands of the Hudson Bay Lowland: An Ontario Overview. Nature Conservancy of Canada, Toronto ON 156 pp. ISBN 978-1-897386-27-9 link • Marshall, T.R. and Jones, N.E. 2011. Aquatic ecosystems of the Far North of Ontario state of knowledge. Ontario Ministry of Natural Resources. 43 p.+ appends. ISBN 978-1-4435-6512-7 Catalogue-natural-resource-scientific-and-technical-publications • Metcalfe, R.A. et al., 2013. Aquatic Ecosystem Assessments for Rivers. Science and Research Branch, Ministry of Natural Resources, Peterborough, Ontario. 210 pp.link		
43	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Appendix A – Missing source information: MNRF Natural Heritage Reference Manual (NHRM), 2014. – Please add MNRF Natural Heritage Reference Manual (2014) to the list of published sources of information for existing conditions. – The Natural Heritage Reference Manual can be referenced in conjunction with the Significant Wildlife Habitat Technical Guide (SWHTG) 2000, which are not mandatory for the EA, but provide clear guidance. The NHRM outlines evaluation processes of habitat and other natural heritage features. The SWHTG offers guidance to evaluate and identify the significance of wildlife habitat. – Appendix A 1 The EA should expand upon the criteria and indicators that are provided and develop indicators that can readily be quantified (e.g. number of water crossings required, number of wetlands, number of kms of wetlands to be crossed, or sensitive areas impacted). Appendix A of the ToR should be revised to include indicators for the proposed criteria that are quantitative in nature.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report. ■ Indicators have been identified based on background information, consultation with regulatory agencies, public and indigenous consultation.	■ Appendix A ■ Section 9
44	MNRF	■ Letter received from Dave Barker, Resources Management Supervisor, Nipigon District, MNRF on the Draft Terms of Reference	■ Draft Criteria and Indicators for Alternatives Evaluation Appendix A – Available resources to help inform the draft criteria and indicators include research publications and expert knowledge on topics such as stressor-effects pathways, cumulative effects, and associated environmental components and indicators. – Contacting researchers such as Rob Mackereth (MNRF) who has published research on these topics and related subjects is encouraged. – Rempel, R.S., et. al. 2016. Support for development of a long term environmental monitoring strategy for the Ring of Fire area. Ontario Ministry of Natural Resources and Forestry, Science and Research Branch, Peterborough, ON. Science and Research Information Report IR-08. 34 p. + append. Catalogue-natural-resource-scientific-and-technical-publications – While no specifics are provided in this submission, MNRF welcomes a discussion with MECP and ENDM to explore what (if any) role this project could play in advancing baseline information and long-term environmental monitoring for the Ring of Fire in partnership with First Nations communities.	■ Data sources are being reviewed for their appropriateness and will be included in Study Plans where applicable. Information on specific data sources and their relevance to the Project will be included in the IS / EA Report.	■ Section 7 ■ Appendix A

Table 11-3: Study Plan Federal and Provincial Concordance – Requirement Deviations

ID #	Federal TISG Reference or Provincial Draft ToR Comment Reference	Requirement / Comment / Concern	Response (Rationale for Not Meeting Requirement)	Justification (For Not Complying with Requirement Including for Example Scientific Research, Precedence)	Proposed TISG Amendment
1	■ TISG Section 14.1, Page 85	■ The Impact Statement must assess the potential for emissions from the Project to contribute to acid deposition and exceedances of critical loads for terrestrial and aquatic ecosystems;	■ There will be no assessment of emissions from the project to contribute exceedances of critical loads for terrestrial and aquatic ecosystems. There is no threshold established to determine that a specific concentration of NOX and SO2 would be detrimental to the terrestrial and aquatic valued components.	■ There is no threshold established to determine that a specific concentration of NOX and SO2 would be detrimental to the terrestrial and aquatic valued components. Studies to establish these thresholds have never been undertaken.	■ Remove Requirement
2	■ TISG Section 15.2	■ "Account for changes in detection pre- and post-project construction. For instance, roads allow for greater detection distances and therefore any estimates of abundance or presence need to account for differential detectability; describe the effects caused by the new habitat types created in the project area by clearing vegetation. ■ The new habitats created may attract migratory birds, which were not present before (such as the Eastern Whip-poor-will or the Common Nighthawk). Describe how these species at risk may be impacted by the project."	■ Post-construction survey requirement will be determined based on the results of the IA / EA, and changes in detectability will be accounted for in the IS / EA Report, if impacts are determined.	■ Update to include this as a request – rather than a requirement as planned pre-construction surveys will be developed during the IA / EA.	■ "If applicable: Account for changes in detection pre- and post-project construction. For instance, roads allow for greater detection distances and therefore any estimates of abundance or presence need to account for differential detectability; describe the effects caused by the new habitat types created in the project area by clearing vegetation."

12. References

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Appendix A

Preliminary List of Data Sources

Information requests and publicly available data (i.e., data banks and databases) from the following sources:

- Federal government (e.g., Environment and Climate Change Canada, Health Canada)
- Ontario provincial government (e.g., the MECP, the MNRF, the ENDM)
- Natural Heritage Information Centre Make-a-Map: Natural Heritage Areas and Rare Species Records (MNRF 2020a)
- Crown Land Use Policy Atlas (MNRF 2005)
- Land Information Ontario (LIO) base mapping data for ANSIs (MNRF 2020b)
- Ontario Land Cover Compilation V 2.0 (MNRF 2020c)
- Ontario's Provincial Satellite Derived Disturbance Mapping digital resource (Government of Ontario 2020)
- Ontario's Far North Land Cover Layer (MNRF 2014a) Ramsar Canada Sites (Ramsar Canada 2020)
- Local Governments (i.e., Municipalities of Greenstone and Thunder Bay, local Indigenous communities (i.e., Indigenous Knowledge)
- Natural Resource Management Plans; Wetland guidance documents from other Canadian Provinces, and federal guidance documents [i.e. Far North Biodiversity Project (Ontario Biodiversity Council 2020); Forest Management Plans (Long Lake Forest Products Inc. 2008), Alberta Wetland Policy (2020); The Wetland Ecological Functions Assessment (Environment Canada 2008), The Wetland Network (2020)]
- Species Recovery and Restoration Plans
- Atlases (i.e., Ontario Reptile and Amphibian Atlas, iNaturalist [2020])

Other sources of data

- Academic institution and academic journal articles (i.e., Packalen *et al.* 2014; Leclair *et al.* 2015; MNRF 2013)
- Field studies, including site-specific survey methods
- Monitoring program databases protected areas, watershed or coastal management plans (i.e., Ring of Fire Baseline Environmental Monitoring Program; MECP 2019)

- Land cover data, including: terrestrial ecosystem mapping products, forest cover maps, remote sensing resources
- Important habitats and features to include:
  - water bodies, wetlands, watercourses;
  - riparian habitat;
  - river banks or other eroded habitats;
  - artificial water sources;
  - forest, tree patches, solitary trees (especially old decaying trees);
  - forest edges and tree rows;
  - ridges, including eskers;
  - caves and mines;
  - cliffs, rock outcrops, exposed bedrock, talus, and other karst topography;
  - buildings, bridges, and other anthropogenic features, including linear features;
  - sources of artificial lighting attracting insects;
  - critical habitat; and
  - any other habitat features known to be important in the area.
- Published literature, such as peer reviewed journals, reports by think tanks, nongovernment organizations and government reports (e.g., COSEWIC Recovery Strategies)
- Wolverine Observation Datasets (Wildlife Conservation Society Canada)
- EA documentation, including monitoring reports, from prior projects in the area and similar projects outside the area, regional studies, project assessments and strategic assessments
- Renewable harvest data

Appendix B

Agency Comments on the Draft Study Plan

Draft Study Plan Comments – Federal

Comment # / Ref #	Draft Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Section Reference
GC	■ GC	■ Sections 5, 6, 7, 13, 19.2 and 25	■ In addition to the required actions detailed below, other required actions to be addressed in the update to this study plan are detailed in a separate table titled "2020-07-02 – IAAC to MFCAR - General Comments on MFCAR Draft Study Plans". The Agency has provided these other required actions to highlight common sections of the GUIDELINES where requirements were not met in the draft study plans submitted to the Agency. These additional actions must be addressed in the updated study plans.	■ We have reviewed the relevant comments and incorporated where appropriate. Please refer to the General Comments Table Response submitted separately to the Agency for specific responses.		■ Various Sections in Birds and Wildlife Study Plans
Editorial Comment	■ Section 4.1.2.1 2019 Golder Bat Surveys – "Wildlife Acoustics Song Meter SM4BAT FS acoustic monitors were deployed at 167 stations within the LSA in suitable habitats to record bat activity during the maternity roosting period (June 1 to June 30) to determine if SAR bats are present in these communities. The acoustic detectors were set to record from 30 minutes before sunset to 30 minutes after sunrise for a period of at least 10 days. The detectors were set up June 13-17, 2019 in the maternity roosting window and collected from September 2-4, 2019. One bat detector failed to function, and another bat detector was stolen, therefore data was collected from 15 stations."	■ Editorial Comment	■ Typo in either the number of units deployed (167) or the number from which data were collected (15)	■ Clarify the number of acoustic monitors deployed and from which monitors data were collected.	■ The Study Plan has been updated from 167 to 17.	■ Wildlife Study Plan: Section 7.2.1.2.2
WH-01	■ Section 3: Spatial Boundaries: Study Areas – "The LSA currently being considered for wildlife within the scope of the ongoing regulatory review process generally includes the area within 2.5 km of the centreline of Alternative 1 and alternative 4, with the exception of studies related to Wolverine (Gulo gulo) where 10 km beyond the PSA will be considered as per the TISG. The Study Area generally allows for	■ Section 7.4.1 – "Delineate spatial boundaries (i.e., regional study area, local study area, and project study area) to meet the following objectives: a. range of land cover types should be representative of the defined spatial extent; b. the spatial pattern of the land cover types should be well distributed across the defined spatial extent (e.g., revise if one or more land	■ It is unclear if the planned PSA, LSA, or RSA boundaries were defined with respect to items a-c in Section 7.4.1 of the Guidelines, including if simulation modelling was used. ■ Omission of project components other than the route itself are likely to provide an incomplete understanding of baseline conditions relating to the overall project. ■ LSA is defined to include PSA adjustments, but if PSA is adjusted, the LSA should also be adjusted to	■ Provide details to demonstrate that the planned PSA, LSA or RSA boundaries were defined with respect to the requirements described in Section 7.4.1 of the Guidelines. ■ Provide details to demonstrate that project components other than the route itself will be included in the PSA and consequently what areas are included in surveys discussed as relating to the PSA.	■ Study Plan **Section 6.2** indicates that the Project Development Area (PDA) encompasses the 100 metre-wide CAR right-of-way (ROW), temporary construction access roads, work areas, worker camps, and long-term aggregate sources and associated access roads. The specific location of Project components, including the roadway, pits and quarries, aggregate source areas and temporary infrastructure, are not yet	■ Birds and Wildlife Study Plans: Section 6.2

Comment # / Ref #	Draft Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Section Reference
	the documentation of existing conditions and prediction of potential environmental effects for the Project. A 5 km wide Study Area also allows for route refinements during development of Project design (e.g., adjustment of the alignment to avoid sensitive features). – The PSA encompasses the 100 m wide CAR right-of-way, temporary construction" ■ Section 7: Concordance with federal and provincial guidance – "Project components other than the route itself are unknown at this time"	cover types is concentrated in one sub-area and uncommon in other parts of the area); and c. low to moderate rate of change in the prevalence of one or more land cover types with increasing distance from the (i.e., to use land cover patterns to constrain the distances within which comparisons should be made)….For Species valued components: The local study area should correspond to the project study area plus a buffer defined with objectives a-c above. Use simulation modeling to help define a buffer that captures objectives a-c for each species or species group." ■ Section 8.9 – "Project components other than the route itself should be sampled. Such components that are linear (e.g., access or service roads) should be surveyed using transects as above. Non-linear components (e.g., aggregate pits) should be surveyed using a grid of sites spaced 250 metres apart and be sufficient to cover the Project component, plus a maximum 3-kilometre buffer. As with transect lengths, modification of buffer width to a minimum of 500 metres may be justifiable if land cover analysis demonstrates no further change in land cover classification with increasing buffer width…. Design suggestions for Project Study Area and Local Study Area scales... Transect lengths less than 5 kilometres may be suitable but should be justified with respect to an analysis of land cover that demonstrates no further change in land cover composition with increasing distance from the intersection of route and transect mid- point."	encompass changes in expected direct effects from new PSA. PSA should encompass all potential project footprints and LSA expand beyond that. To assist with providing the information needed, an illustration is offered relating to land cover analysis to help define transect lengths. The following is an illustration of the land cover analysis referred to in this section of the Guidelines, for the purpose of defining study area boundaries in relation to the Esker VC. 1. Identify the eskers and similar geological features (e.g. moraines) potentially affected by the project. For those features, identify the land cover types that occur within the geologically defined esker (or moraine) polygon. 2. Identify the major land cover types by calculating, across all the individual eskers (and moraines) potentially affected by the project, the types of land cover that make up 80% or more of the surface area of these features. 3. For each esker (or moraine), determine the individual percentages of each of the major land cover types within the PSA on each esker (and moraine). 4. In increments (e.g. 100 metres) extend a buffer from the edge of the PSA to 15 kilometres from the edge of the PSA, and calculate the percentage of each of the major land cover types within each increment. 5. For each major land cover type, calculate the rate of change between successive buffer increments in land cover composition (i.e. the difference in percentages between a given buffer increment and the increment one step closer to the PSA boundary). For the first buffer increment, calculate the percent difference between the PSA and that buffer increment.		known and will be included in the IS / EA Report.	

Comment # / Ref #	Draft Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Section Reference
			6. For each major land cover type, determine the maximum calculated rate of change across all buffer increments (i.e. 100 metres to 15 kilometres out from PSA boundary). 7. The LSA boundary for each esker or moraine would then be defined as the buffer width that is the maximum of: a. 500 metres from the PSA boundary, or b. the buffer increment where i. All major land cover types have a rate of change in land cover composition of less than or equal to 5% of the maximum rate of change found in (5), and ii. The increment is beyond (i.e. further away from the PSA) where the maximum rate of change found in (5). 8. This approach is intended to lead to LSA boundaries for eskers and similar geological features that include the esker-related land cover types, the rapid land cover change that occurs along the edges of these features, and a portion of the broader landscape matrix. An ecologically defined LSA should therefore serve as a useful reference for comparing patterns and survey results with the PSA and the RSA. ■ This approach could be used to define LSA boundaries for the Wetland VC and any other habitat VCs.			
WH-02	■ Section 4.1.1 Birds – "Bird surveys were performed for the purpose of the project in 2018 by Zoetica and in 2019 by Golder. A summary of their methods and results are included herein"	■ Section 7.2 – "With regard to field studies, survey work must be planned to include multiple sampling locations and multiple visits to each location to support all required assessment analyses. Existing data should be considered as a limited augmentation of this new data…. …. Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to	■ The 2018, 2019 bird survey data were collected prior to the development to the TISG. The designs do not appear to be compliant with the Guidelines but, if used correctly, may be useful for the proponent in their efforts to develop a TISG-compliant design. More detail would be required to evaluate and provide advice about the use of those data. ECCC provided advice on early designs for these surveys that was consistent with the principles outlined in	■ Provide detail about the final 2018 and 2019 designs and how ECCC advice was incorporated, as well as results and analysis plans, and detailed plans for using those data to inform upcoming survey designs.	■ The Study Plan is updated to outline the 2018 and 2019 study designs in greater detail including coordination with ECCC. Sample sizes have been added where appropriate. Results have been incorporated into determining the sampling frequency for ARU use. Results will also be used for developing preliminary models that will be further refined with additional field data.	■ Birds Study Plan: Section 7.2.1.2

Comment # / Ref #	Draft Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Section Reference
		estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options. – Ethical guidelines and relevant cultural protocols governing research, data collection and confidentiality must be adhered to. Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. – Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options."	the TISG, but did not receive revised plans. ■ The 2018 and 2019 surveys were conducted prior to development of the Guidelines. As such they should be treated as existing data for the IA. They can be of use (e.g. estimates of variance) in developing a bird focused survey design and assessing sample sizes. They can also be included in modelling of baseline conditions to help incorporate more than two years of surveys, so long as the limitations of the survey design are accounted for, in the analysis.			
WH-03	■ Section 4.2 Desktop Assessment – "The background review….as well as identifying potential rare, SAR and species of Indigenous importance that may be present within the Study Areas." ■ Section 4.3.4 Mammals – "The terrestrial mammals currently of importance to our study will be determined using SAR data, ecological composition of the Study Areas and Indigenous Knowledge provided from consultation." ■ Section 7	■ Sections 6, 8.10, 15.3 – Section 6 • "The proponent must engage with all Indigenous groups that may be impacted by the Project. The Indigenous Engagement and Partnership Plan, issued by the Agency, is available to assist the proponent in further developing or refining their engagement strategy and supporting ongoing trust and relationship-building. In addition to the requirements set out in section	■ It is unclear what information about species of Indigenous importance will be collected through the desktop assessment and what will be collected through engagement. As per Section 6 of the Guidelines, the Agency expects the proponent to engage with, at a minimum, the Indigenous groups listed in the Indigenous Engagement and Partnership Plan.	■ Provide details to demonstrate that all of the Indigenous groups listed in the Indigenous Engagement and Partnership Plan will be engaged with and provided opportunities to provide input on current use of terrestrial wildlife as a source of country foods and where use or harvesting has Indigenous cultural importance. This includes incorporating into the plan where Indigenous groups will be provided with opportunities to: – provide Indigenous knowledge during baseline data collection;	■ A summary of the consultation plan for Indigenous communities, government agencies, and interested persons has been provided in **Section 4** of the Study Plan; further details can be found in the IS / EA Consultation Plan included as Appendix B of the Proposed ToR. Specific consultation and engagement activities and schedules are currently in development and will be shared with MECP and the Agency once available.	■ Wildlife and Birds Study Plans: Section 4.2 and Section 5.

Comment # / Ref #	Draft Study Plan Section	TISG Section	Comment / Context	Action Item	Final Response	Study Plan Section Reference
	– "Documentation of the historic and current use of terrestrial wildlife resources will be identified as a source of country food or of cultural importance to indigenous peoples, including harvesting of fur bearing mammals…. – …potential adverse effects to species of indigenous significance and their habitat will be collected through desktop assessment and provided in the IA/EA."	6.1, 6.2 and 6.3, the proponent must provide Indigenous groups with an opportunity to: provide Indigenous knowledge during baseline data collection; comment on the list of valued components and indicators…" – Section 8.10 • "describe the historic and current use of terrestrial wildlife as a source of country foods (traditional foods) or where use has Indigenous cultural importance (e.g., black bear, caribou, deer, moose, beaver, arctic fox, fisher, wolverine, rabbits, marten, muskrat, and otter)… …describe the use and harvesting of fur-bearing species and whether its harvesting has Indigenous cultural importance" – Section 15.3 • "describe the potential adverse effects of the Project on species noted as important to Indigenous groups and local communities and their habitat that are not currently listed under the Species at Risk Act or provincial statutes"		– comment on the list of valued components and indicators; – inform the effects assessment and review its conclusions; and – inform the development of mitigation measures and follow-up programs.		
WH-04	■ Section 4.1.2.1 2019 Golder Bat Surveys	■ Section 8.11 – "clearly describe methods used to define a bat "pass" and be consistent with the definition used for any comparison group. Provide a rationale for the chosen method; clearly describe methods used for acoustic identification, including any validation procedures used, criteria used for deciding on species classifications, and software used (including versions and settings);"	■ It is unclear what methods and rationale were used to define a bat pass in the 2019 Bat Surveys.	■ Provide details to demonstrate the methods used to define a bat "pass" during the 2019 Bat Surveys. Provide a rationale, as required in Section 8.11 of the Guidelines.	■ The Study Plan is updated to incorporate the 2019 bat surveys and the definition for a "bat pass" . Methods rationale will be provided in the IS / EA Report.	■ Wildlife Study Plan: Section 8.1
WH-05	■ Section 4.3 Study Methods	■ Section 8.11 – "survey protocols should provide a rationale for the scope of and the methodology used for surveys including design, sampling protocols and data manipulation"	■ Rationales are not always present or clear for all surveys in Section 4.3 of the study plan.	■ Provide details to ensure that survey protocols, design, methodology, sample size, and data manipulation are clearly explained and rationalized in terms of appropriateness and adequacy to address requirements of the Guidelines.	■ The Study Plan is updated to include details on survey protocols, design, methodology and data manipulations, which are explained and rationalized in terms of appropriateness and adequacy to address requirements of the Guidelines. Sample sizes have been added to the fur bearers.	■ Birds and Wildlife Study Plans: Section 7.2

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WH-06	■ Section 4.3.1.1 Field Study Design – "Data collected will generally be consistent with methods employed by Golder (2019) for forest birds and bog / fen birds and other wetlands birds due to the abundance of such habitats… A point count survey location will be conducted within each vegetation community identified for Ground Investigations, within 1 km of helicopter landing pads. Note that pre-selected Ground Investigation locations may be revised based on site conditions observed during field investigations." – (Comment is relevant to several sections of 4.3.1.1 in the proponent's plan that relate to the intended sampling)	■ Section 8.9 – -Refer to original comment PDF from IAAC and TISG if more context is required – [Also Applicable or partly applicable to other sections of the Guidelines that refer to modeling and/or simulations, e.g. 7.1, 7.2, 7.4.1, 8.1, 8.2, 8.5, 8.11, 13.1, and 21]	■ Clarifications on the survey design advice and intended uses of modeling and simulations are offered. ■ Section 8.9 of the Guidelines describes and recommends tools and approaches for Design Planning, including developing and selecting a survey design from design options. ■ The intention of this section of the Guidelines for the Design Planning phase is to identify a series of principles that should be used to guide and evaluate survey design options; offer detailed design elements as inputs and as a starting point for developing alternative design options; and recommend modeling, using existing and/or simulated data to evaluate those design options against a series of criteria that would include the design principles. ■ An important element is that the proponent is uniquely able to include information and data specific to the project (e.g. detailed plans of road construction and routing, detailed imagery and existing proponent-collected data). Integrating this proponent-held information enables the proponent to develop design options (or scenarios) that incorporate detailed local information along with the Guidelines-derived design principles and tools. Departures from the offered design should be justified, explained in detail and should clearly demonstrate how the chosen design adheres to the design principles provided in the Guidelines. Detailed descriptions of design process and design outcomes (including maps, sample sizes overall and by landcover type) are required to understand and evaluate the design relative to the Guidelines. Following this approach should lead to a detailed platform for evaluating the sufficiency of the selected design, for communicating the rationale for choosing that design, and for	■ Submit an updated survey design in consideration of the project context and the instructions provided.	■ The Study Plan is updated to incorporate details on survey design and data analysis recommendations including simulation modelling per Section 8.8 of the TISG (the Agency 2020a).	■ Birds and Wildlife Study Plans: Section 8 and Section 9.4

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			communications regarding clarifications, suggestions and recommendations. ■ Simulation modeling is the process of generating and analysing hypothetical data, often in the context or with the purpose of comparing with actual data. Evaluation of survey design options can benefit from a simulation modeling approach through comparison of the representativeness of a potential sampling design relative to more intensive design options. This is a broad and diverse field but a search in the ecological literature (e.g. with keywords power analysis) should produce relevant examples of approaches and methods. Survey results from the 2018 and 2019 preliminary data collection can be very useful to assess sample size sufficiency and guide simulations, so long as analysis and interpretations account for the limitations of these designs and surveys. ■ (NOTE: Detail provided is insufficient to fully understand the 2018, 2019 designs and results.) ■ Section 8.9 of the Guidelines describes and recommends tools and approaches for data analysis, including conducting analysis using the data, both pre-existing and those data collected during the bird (or other) surveys. ■ The intention of Section 8.9 of the Guidelines for data analysis is to guide data acquisition to ensure that the necessary quantitative data would be available to ensure appropriate analysis and reliable interpretations and ensure these covariates were included in the analysis of the collected bird (and perhaps other) survey data. ■ The purposes of these covariate data are to enable the evaluation of their influence on the bird (or other) survey results, and to quantify that influence and account for it in the extrapolation and results-interpretation stages. Doing so reduces the chance that			

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			interpretations about the birds are made in error through a misunderstanding of the patterns and statistical results. ■ For example, if the esker sites A, B and C were surveyed on days with no wind and the peatland sites D, E and F on days with light wind and occasional rain (which may affect both detection and bird vocal behaviour), the lower bird species richness of sites D, E and F might be entirely (and mistakenly) attributed to habitat differences. Modeling that included wind and rain covariates would be more likely to differentiate these effects and lead to better extrapolations and interpretations of the data. Likewise, surveying in one or two years increases the risk having unexplained abundances in the baseline estimate. For example if surveys were conducted in a year that involved a 'masting' event, measured abundances of baseline conditions could be much higher than an average across several years. A similar event could occur if surveys were only conducted in a particularly cold or warm season, relative to the long-term average. ■ Resources and examples for the use of covariates in modelling are abundantly available through scientific journals and statistical texts. Examples of potential key words for searches include: hierarchical modeling, generalized linear (mixed) models, boosted regression trees, Bayesian modeling. Modelling should aim to generate predictive estimates of abundance (or density/occurrence if justified) across the LSA, PSA, and RSA and to provide predictive estimates with associated margins of error at scales that are justified at the scale and shape of the study areas. Total area may not be an appropriate measure of scale for linear projects that are small scale at any point, but stretch along a large area due to length. Modelling should be able to predict			

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			local effects along the project as well as larger scale patterns along the length of the project. Useful predictions require data inputs from each of the study areas to which extrapolations will be made.			
WH-07	■ Section 4.3.1.1 Field Study Design – "Prior to field investigations and as part of study design, vegetation communities will be characterised (pre-typed) and delineated by GIS analysts and vegetation specialists through a desktop exercise for both the PSA and LSA. Following which, a representative subset of vegetation communities (upland, wetland and riparian) will be selected for field verification through a stratified random sampling technique…" – (Comments relevant to other text in the Design section of the plan)	■ Section 8.9 – Collect data in a manner that enables reliable extrapolations in space (i.e., at minimum to Project, local and regional study areas) and in time (i.e., across years):... • …design suggestions for Project Study Area and Local Study Area scales: Use a standardized design approach during survey planning. The resulting design details will serve as the basis to develop alternative designs, evaluate options for particular design details, and to identify potential efficiencies. The approaches and tools suggested elsewhere in this document (e.g., land cover analysis, data simulations) should be considered during the planning phase. The following should be considered as inputs to design planning and evaluation…" – (see list that follow in the Guidelines for all requirements)	■ Adding bird sampling to a design that was created for the purposes of a vegetation study is not likely to provide robust bird results as per the Guidelines. The planned bird survey design should be described in such a way as to enable an evaluation of the steps taken to create the design and clearly describe sample sizes and locations. ■ Design the study of birds using point count and ARU locations in a way that is not dependent on the study design for vegetation verification. The goals are different between the two and therefore sample sizes and distribution of samples will need to differ between the two studies. ■ A series of ground level photos at each site visited for bird surveys and Ecosite typing of each site visited for the bird surveys using the ground level photos is required, as per the requirements in Section 8.9 of the Guidelines. FNLC should be used as land cover input.	■ Provide details about the proposed bird survey design that includes the steps taken to determine the sample sizes and locations. Provide ground level photos and Ecosite typing at each site visited for bird surveys.	■ The Study Plan is updated to include a revised study design for birds that is independent of the Vegetation VC Study Plan and outlines the steps taken to determine sample size and survey locations. Habitat will be documented with photographs as described in the Guidelines and classified by ELC Ecosite or Canadian Wetland Classification Class as described under the Vegetation Study Plan for modelling purposes.	■ Birds and Wildlife Study Plans: Section 7.2 ■ Vegetation Study Plan
WH-08	■ Section 4.3.1.1 Field Study Design – "To reduce potential bias associated with selecting locations where access can be achieved by helicopter and for a robust subset of sites, a secondary analysis will be run to determine if any vegetation community types will be missed through this approach to assure all individual pre-typed vegetation communities are represented. Should additional sites require Ground Investigations, additional helipads may need to be cut. This approach will be used to assure that rare habitats and features receive adequate sampling that is not biased due to limited access."	■ Section 8.9 – "use simulation modelling prior to sampling to ensure coverage is broad enough to estimate and account for detection error as well as provide unbiased estimates of abundance and distributions."	■ It is unclear if simulation modelling has been used prior to sampling to ensure coverage is broad enough to provide unbiased estimate of abundance and distribution, as required in Section 8.9 of the Guidelines. Refer to comment WH-06 for further clarifications on the survey design advice and intended uses of modeling and simulations. Limiting bird sample locations to those easily accessible will likely lead to habitat biases in the sample.	■ Provide details about survey design and simulation modelling used to demonstrate how habitat bias will be avoided.	■ The Study Plan is updated to incorporate details on survey design and data analysis recommendations including simulation modelling and methods to avoid bias.	■ Birds and Wildlife Study Plans: Section 8 and Section 9.4 ■ Vegetation Study Plan

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WH-09	■ Section 4.3.1.1 Field Study Design – "PSA Based on the anticipated size of the PSA (greater than 4000 hectares [ha]), the intent of the field program is to complete field verification on 15-25% of the vegetation communities within the PSA. This percentage represents a Survey Intensity Level 4 according to the Standard for Terrestrial Ecosystem Mapping in British Columbia (EWG 1998). Although these guidelines originate in British Columbia, a similar guideline to provide consistency across projects has not been developed for Ontario and therefore should be an acceptable approach. This sampling intensity is the survey intensity level recommended for most mapping and is appropriate for a Project of this size and represents a respectable compromise between costs and meaningful data collection."	■ Section 8.9 – [Also applicable or partly applicable to other sections of the TISG that refer to modeling and/or simulations, e.g. 7.1, 7.2, 7.4.1, 8.1, 8.2, 8.5, 8.11, 13.1, and 21]	■ The sampling intensity guideline referenced in the study plan (i.e. Standard for Terrestrial Ecosystem Mapping in British Columbia; EWG 1998) is for ecosystem or vegetation mapping at a 1:20000 to 1:50000 scale. This does not provide acceptable justification for sample size or distribution when it comes to collecting bird data and modelling bird abundances or distributions.	■ Provide details about survey design and simulation modelling used to demonstrate that the proposed sampling intensity will provide unbiased estimates of abundance and distributions, as per the requirements in Section 8.9 of the Guidelines.	■ The Study Plan is updated to incorporate details on survey design and describes methods proposed to avoid bias.	■ Birds and Wildlife Study Plans: Section 8 and Section 9.4 ■ Vegetation Study Plan
WH-10	■ Section 4.3.1.1 Field Study Design – "PSA & LSA Although every effort will be made to adhere to this sampling intensity, the Project is located in a remote part of Canada with limited access. Access to vast portions of the proposed CAR will only be available by air, therefore survey locations will be limited to where a helicopter is capable of landing (i.e., cut helicopter landing pads, grassy riparian areas)."	■ Section 8.9 – "If necessary to constrain or adjust site selection based on access limitations, simulation modelling should provide evidence that this sampling strategy has not resulted in the introduction of bias." – [Also applicable or partly applicable to other sections of the TISG that refer to modeling and/or simulations, e.g. 7.1, 7.2, 7.4.1, 8.1, 8.2, 8.5, 8.11, 13.1, and 21]	■ The study plan should designate, according to the design principles in the Guidelines, oversample locations to assist with situations of limited access. This will help reduce the potential for bias in the collected data, while still accommodating some degree of access limitation.	■ Provide details to demonstrate how the potential of bias will be reduced when issues related to limited access occur.	■ The Study Plan includes oversample locations selected using Generalized Random Tessellation Stratified (GRTS) to assist with situations of limited access.	■ Birds Study Plan: Section 7.2.2.1
WH-11	■ Section 4.3.1.1 Field Study Design – "RSA Baseline information for the RSA will need to be robust enough to support an assessment of indirect effects on vegetation. Considering the level of existing information on vegetation communities within the RSA (FNLC and FRI mapping), field investigations for vegetation will not be conducted within the broader RSA. Effects on vegetation with the RSA are not expected to be wide ranging and therefore effects can adequately be	■ Section 8.9 – "Efforts outside the project study area should be carefully designed to ensure that estimates comparing within and across the project study area, local study area and regional study area are unbiased and as precise as possible… – …sample size must be planned to support a robust evaluation of the project study area within the context of the local study area and regional study area… – "Simulation modelling should be used to assess bias and precision between	■ It is unclear how the text provided in Section 4.3.1.1 of the study plan is related to the bird survey. It is not clear what level of sampling will take place in RSA for wildlife VCs. The rationale provided is in relation to vegetation sampling. ■ The study plan does not indicate that bird surveys will be done in the RSA. More detail is needed to determine how the requirements of Section 8.9 will be met. ■ Sample sizes and designs must support evaluation of the three study area scales	■ Provide details to demonstrate how the text in Section 4.3.1.1 is relevant to the bird survey. ■ Provide detail to demonstrate how the requirement in Section 8.9 of the Guidelines regarding field surveys in the regional study area will be met. Detailed information is needed showing the intended sample size within each of the study area scales, along with estimates of the variability in expected metrics (e.g. species level abundance, species richness) within each of those scales.	■ A simulation was completed which indicates that the LSA is representative of the RSA based on the percentage composition of land cover types. ■ Results of simulation modelling using data collected in the LSA provides unbiased models for making predictions in the RSA. The Study Plan describes how models will used to extrapolate abundance of bird species in each Bird VC to the RSA scale based on habitat availability.	■ Birds Study Plan: Section 9.4.2

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	assessed using the existing and desktop derived information" ■ Section 7 Conformance with Federal and Provincial Guidance – "The requirement cannot be addressed as: • It should be sufficient to collect background data for the regional study area and extrapolate results from the project and local study area."	project study area, local study area, and regional study area to ensure the estimates are useful for comparison. Field surveys should occur within the regional study area since there are few existing sources of data that effectively describe regional bird populations in areas, including this area, that are distant from road networks."	(PSA, LSA, RSA), so detailed information is needed that shows intended sampling within each of these scales along with estimates of variability within each of those scales.			
WH-12	■ Section 4.3.1.1 Field Study Design – "Bird indicator are to be collected to account for temporal sources of variation including among years (two years minimum), within and among seasons (e.g., spring migration, breeding season, and late summer / fall migration), and within a 24-hour daily cycle." ■ Section 4.3.1.8 Data Collection – "During migration (spring and fall), three 3-minute segments per week will be randomly selected from the Morning Period (1 hour before sunrise to 5 hours after sunrise)."	■ Section 7.4.2 – "For valued components related to wetlands, eskers, birds, wildlife, and Species at Risk, define temporal boundaries in a manner that enables detection of all species that use the project study area, local study area, and regional study area throughout the year and between years, and to estimate their temporal pattern of use (e.g., breeding, or migrants stopping on northward and/or southward migration). Baseline data collection for all biophysical valued components is to be provided for a minimum of two years, unless specified otherwise. Temporal boundaries spanning more than one year will enable accounting for variation due to irregular events (e.g., masting events, storms on migration, late snowfalls)." ■ Section 8.9 – "collect bird data to adequately represent the following temporal sources of variation: • among years; • within and among seasons (e.g., spring migration, breeding, fall migration, overwintering); and • within the 24 hour daily cycle. – …collect field data over at least two years. The goal of collecting data over multiple years is to improve the understanding of natural variability in populations. Two years of sampling is suggested as a minimum. As the number of sampling years increases so does the understanding of natural variability;"	■ More information is needed to determine how the requirements in Sections 7.4.2 and 8.9 related to temporal sources of variation will be met. ■ It is unclear how the approach provided in Section 4.3.1.8 will account for the temporal sources of variation. Singing frequency may be less during spring migration than during the nesting phase. Singing frequency may be much less during fall migration but migrating mixed-species flocks do call regularly enough to be detected and identified by appropriate sampling of acoustic files and with skilled interpreters. Recordings may need to be evaluated to determine if planned sampling frequency is sufficient.	■ Provide specific detail, including methods and approaches, to demonstrate how these requirements related to temporal boundaries and collection of data required in the Guidelines will be achieved.	■ The Study Plan has been revised to include ARU deployment during spring migration (April 15-May 31), fall migration (August 1-September 30) and early winter (December 1-December 31) or late winter (March 1-31). Proposed winter sampling is reduced due to temperature limitations of ARU. ■ Planned sampling frequency and analysis proposed during spring and fall migration and early winter (i.e., three 3-minute segments randomly selected from the Morning Period per week) is in line with recommendations in section 8.9 of the Guidelines (page 54). ■ Specific locations and dates of ARU deployment will be provided at a later date.	■ Birds Study Plan: Section 7.2.2

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WH-13	■ Section 4.3.1.1 Field Study Design – "The location of survey sites is expected to be spatially uneven due to differences in habitat diversity across the RSA. Furthermore, the proposed routes are remote with limited access to important habitats and features. To reduce potential bias associated with selecting locations where access can be achieved by helicopter and for a robust subset of sites, a secondary analysis will be run to determine if any vegetation community types will be missed through this approach to assure all individual pre-typed vegetation communities are represented. Should additional sites require Ground Investigations, additional helipads may need to be cut. This approach will be used to assure that rare habitats and features receive adequate sampling that is not biased due to limited access."	■ Section 8.9 – "1. Within each sampling year, ARUs should be deployed at sites as long as possible, with a minimum period of May 1 through July 10 (Breeding Recordings). Use deployments that maximize full use of battery and sound card capacity; – 2. A subset of at least 50% of the ARU sites should have ARUs deployed to align with periods during which sites are used by birds in fall migration (August 1 through September 30) and during the winter (December 1 though March 31) (i.e., collectively, Fall/Winter Recordings). These fall and winter sites may be a subset of either entire ARU transects or sites along transects but land cover analysis should be used to ensure the subset is an unbiased sample of the population of ARU sites."	■ It is unclear if the requirements in Section 8.9 of the Guidelines will be met. More information is needed to identify the locations of ARU deployments and a detailed treatment of the location schedule.	■ Provide details to demonstrate an alignment with the Guidelines, including numbers of ARUs, specific dates of their deployment and re-deployment to new locations, and explanations of the rationale for the selected schedules.	■ The Study Plan has been revised to include ARU deployment during spring migration (April 15-May 31), fall migration (August 1-September 30) and early winter (December 1-December 31) or late winter (March 1-31). Proposed winter sampling is reduced due to temperature limitations of ARU. ■ Planned sampling frequency and analysis proposed during spring and fall migration and early winter (i.e., three 3-minute segments randomly selected from the Morning Period per week) is in line with recommendations in Section 8.9 of the TISG (the Agency 2020a). ■ Specific locations and dates of ARU deployment will be provided at a later date.	■ Birds Study Plan: Section 7.2.2
WH-14	■ Section 4.3.1.1 Field Study Design – "Bird indicator data will be collected within the following important habitats and features identified in the TISG: • Water bodies, wetlands, watercourses; • Riparian habitat; • Riverbanks of eroded habitats; • Artificial water sources; • Forest, forest patches, solitary trees (especially old decaying trees); • Forest edges and tree rows; • Ridges, including eskers; • Cliffs, rock outcrops, exposed bedrock, talus, and other karst topography; • Building, bridges, and other anthropogenic features; and • SAR critical habitat."	■ Section 7.2 – "Information sources and data collection methods used for describing the baseline environmental, health, social and economic setting may consist of the following sources of information. For specific sources of baseline information, see Appendix 1. – Important habitats and features to include: • water bodies, wetlands, watercourses; • riparian habitat; • river banks or other eroded habitats; • artificial water sources; • forest, tree patches, solitary trees (especially old decaying trees); • forest edges and tree rows; • ridges, including eskers; • caves and mines; • cliffs, rock outcrops, exposed bedrock, talus, and other karst topography; • buildings, bridges, and other anthropogenic features, including linear features; • sources of artificial lighting attracting insects;	■ Detail on proposed survey location selection is sufficient, but it does not align with the Guidelines. ■ This plan uses the list of important habitats and features in Section 7.2 of the Guidelines as an explanation of survey location selection, but that is not how the list was presented in the Guidelines. The Guidelines present this list with respect to potential sources of baseline information in general. It is not intended as a basis for sampling or a list of recommended features to survey for birds.	■ Provide details to demonstrate that the proposed survey design, including location selection and data collection, will meet the requirements in Section 8.9 of the Guidelines.	■ Important habitats described in Section 4.3.1.1 of the TISG (the Agency 2020a) have been integrated into the breeding bird study design using point counts and ARUs (forests, forest edges, ridges/eskers, riparian, watercourses) or through marshbird call playback (wetlands), species-specific surveys (river banks, cliffs, rock outcrops, exposed bedrock, talus, and other karst topography), and aerial surveys (wetlands, waterbodies, watercourses).	■ Birds Study Plan: Section 7.2.2.1 and Table 7.2.

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		• critical habitat; and • any other habitat features known to be important in the area."				
WH-15	■ Section 4.3.1.1 Field Study Design – "A point count survey location will be conducted within each vegetation community identified for Ground Investigations, within 1 km of helicopter landing pads. Note that pre-selected Ground Investigation locations may be revised based on site conditions observed during field investigation… Based on the anticipated size of the PSA (greater than 4000 hectares [ha]), the intent of the field program is to complete field verification on 15-25% of the vegetation communities within the PSA. This percentage represents a Survey Intensity Level 4 according to the Standard for Terrestrial Ecosystem Mapping in British Columbia (EWG 1998). Although these guidelines originate in British Columbia, a similar guideline to provide consistency across projects has not been developed for Ontario and therefore should be an acceptable approach. This sampling intensity is the survey intensity level recommended for most mapping and is appropriate for a Project of this size and represents a respectable compromise between costs and meaningful data collection. Ground Inspections and Visual Checks will be conducted in accordance with the survey intensity levels (EWG 1998) at a ratio of 25:75 respectively. Although every effort will be made to adhere to this sampling intensity, the Project is located in a remote part of Canada with limited access. Access to vast portions of the proposed CAR will only be available by air, therefore survey locations will be limited to where a helicopter is capable of landing (i.e., cut helicopter landing pads, grassy riparian areas)."	■ Section 7.2 – "Baseline data must be collected in a manner that enables reliable analysis, extrapolations and predictions. Resulting data should be suitable for analyses to estimate pre-project baseline conditions, derive predictions of impacts, and evaluate and compare post-project conditions and at scales of within and across the Project, Local and Regional Assessment areas. Modelling methods, error estimates and assumptions should be reported (as per section 7.1). Modelling and simulations should be used early in the planning phase to estimate the necessary sampling intensity and to quantitatively evaluate the effectiveness of design options."	■ Rationale is provided for this level of sampling in relation to mapping vegetation communities, but rationale is needed to indicate that this sampling intensity is adequate for each wildlife VC.	■ Provide detail to demonstrate how the requirements in Section 7.2 of the Guidelines will be integrated into survey design, including providing a rationale for the selected sample size for all surveys discussed in Section 4.3 of the study plan.	■ Simulation modelling using preliminary bird data was conducted to determine the total number of site visits required to adequately sample the various bird VCs and bird SAR VCs beyond the initial 2018-2019 field season. The upcoming work plan will provide a breakdown of the number of survey stations by land cover. The sample frequency and intensity for various bird SAR have been provided based on a beta diversity analysis / species accumulation curve using preliminary data or a binomial expansion of published detection probabilities. ■ The Study Plan is updated to provide detail on how the sampling locations for bat surveys are determined by habitat suitability in the desktop review. Wolverine aerial tracking survey transects are based on a modified protocol for aerial caribou surveys (MNRF 2018), due to the relatively low density of wolverine. Survey design for furbearer winter tracking, motion sensitive camera tracking, and wolverine hair snag trap surveys are described in the Study Plan.	■ Wildlife Study Plan: Section 7.2.1.2 and Section 7.2.3.2 ■ Birds Study Plan: 7.2.2.1 and 7.2.2.5

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WH-16	■ Section 4.3.1.2 – Breeding Bird Point Counts "Only observers skilled in bird identification by sight and sound will be used for breeding bird surveys. Furthermore, additional bias will be removed by recording all bird vocalizations during breeding bird surveys using a high-quality portable recording device mounted on a tripod. Observer and recorder data will be compared for further analysis."	■ Section 8.9 – "Observers should be skilled in bird identification by sight and sound, and should use 1- minute intervals within the 10-minute point count duration such that each individual bird is entered in the first minute interval in which it was detected. Estimated distances from observers to each bird should be recorded as: 0-50m, 50m-100m, and beyond 100m… acoustic files should be analysed by interpreters skilled in identifying birds by sound and familiar with bird communities of the region sampled. Interpretation of acoustic files should be done using the Wildtrax interface"	■ Observers should have skills in relation to northern Ontario birds since bird identification differ geographically and some species sing with regional dialects. ■ Recordings using the Zoom H2n digital recorder or equivalent in conjunction with observers is an appropriate approach.	■ Provide details to demonstrate that that the observers have skills specifically related to northern Ontario birds.	■ The Study Plan is updated to indicate that only observers skilled in Northern Ontario bird identification by sight and sound will be used for breeding bird point counts, and will capture bird calls using the Zoom H2n digital recorder to remove additional bias.	■ Birds Study Plan: Section 7.2.2.1
WH-17	■ Section 4.3.1.3 Marsh Bird Call Playback Surveys – "where suitable habitat is encountered during the breeding bird point counts"	■ Section 8.9 – "Collect data in a manner that enables reliable extrapolations in space (i.e., at minimum to Project, local and regional study areas) and in time (i.e., across years)…. – ….design suggestions for Project Study Area and Local Study Area scales: Use a standardized design approach during survey planning. The resulting design details will serve as the basis to develop alternative designs, evaluate options for particular design details, and to identify potential efficiencies. The approaches and tools suggested elsewhere in this document (e.g., land cover analysis, data simulations) should be considered during the planning phase. The following should be considered as inputs to design planning and evaluation…."	■ It is unclear how the requirements in Section 8.9 of the Guidelines related to survey design and sampling will be met.	■ Provide details to demonstrate how the survey design requirements in Section 8.9 of the Guidelines were integrated into the Marsh Bird Call Playback Surveys described in Section 4.3.1.3 of the study plan.	■ Marshes account for less than 0.1% of the LSA and will be examined separately from the breeding bird survey design due to their small numbers. To survey the largest number of marshes that can practicably be reached, a desktop review combined with aerial reconnaissance were used to identify suitable marsh habitat in proximity to breeding bird survey stations selected using the Generalized Random Tessellation Stratified Study Design. A total of 10 survey stations were identified. Efforts will be made to identify additional marsh bird call playback survey stations.	■ Birds Study Plan: Section 7.2.2.3

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WH-18	■ Section 4.3.1.8 Data Collection – "During the breeding season, one 3-minute segment per week will be randomly selected from the Night Period (midnight to 1 hour before sunrise), two 3-minute segments per week from the Morning Period (1 hour before sunrise to 5 hours after sunrise), and one 3-minute segment per week from the Dusk Period (30 minutes before sunrise to 2 hours after sunset)."	■ Section 7.2 – "The Impact Statement must provide detailed descriptions of specific data sources, data collection, sampling, survey and research protocols and methods followed for each baseline environmental, health, social and economic condition that is described, in order to corroborate the validity and accuracy of the baseline information collected." ■ Section 8.9 – "survey protocol planning should include modeling and simulations to estimate sampling requirements, and analysis to evaluate resulting design options:"	■ The information provided in Section 4.3.1.8 of the study plan does not align with the requirements in Sections 7.2 and 8.9 of the Guidelines. More information is needed to corroborate the validity and accuracy of the baseline information collected.	■ Provide detailed descriptions of the survey protocols and methods followed to demonstrate that the planned survey will enable modelling for reliable conclusions about breeding bird abundances. Provide anticipated sample sizes.	■ The Study Plan is updated to include details on survey protocols, design, methodology and data manipulations to address requirements of the Sections 7.2 and 8.9 of the TISG (the Agency 2020a). ■ Additional information regarding sampling dates and locations will be provided at a later date.	■ Birds Study Plan: Section 8 and Section 9.4
WH-19	■ Section 4.3.2.2 Acoustic Surveys – "Acoustic surveys will be designed to account for inter-annual and within-season variability in habitat use by taking place during multiple nights in the late spring, summer and fall seasons to capture bat dispersal and identify breeding and roosting habitats. Field surveys will be conducted over a minimum of two years to improve the understanding of natural variability in populations." ■ Section 4.3.2.3 Data Collection – "The acoustic surveys targeted for maternity roosting structures will be conducted using Wildlife Acoustic Song Meter SM4BAT monitors. ARUs will be programmed to record ultrasonic activity nightly beginning 30 minutes before sunset to 30 minutes after sunrise for at least 10 days during the maternity roosting period of June 1 to June 30. In addition to maternity roost surveys, any suspected bat hibernacula features documented during the background review or aerial reconnaissance exercises will require similar acoustic surveys. The potential hibernacula will be searched to identify all possible entrances and ARUs will be installed within 10 m of all openings	■ Section 8.11 – "to augment existing information sources and collect data able to robustly establish baseline conditions and assess impacts, undertake site-specific surveys to: • compile a species inventory (species present/not detected); • quantify baseline bat activity to evaluate relative use of different habitats or features in the project area and to help support and evaluate project siting decisions and impact predictions; • document baseline conditions within the project Area and Local Assessment Area to support study of impacts; • the following types of surveys are required: ○ acoustic surveys, ensure study design is statistically valid, conducted in spring, summer, and fall to capture dispersal and migration (travel corridors), breeding, and roosting…"	■ Section 4.3.2.2 indicates that acoustic surveys will take place in spring, summer, and fall; however Section 4.3.2.3 only provides information for surveys in June and potentially August, if suitable hibernacula habitat is discovered. ■ In addition, targeting survey locations to only suitable roosting and hibernacula habitat may not capture dispersal and travel corridors.	■ Clarify and provide rationale for how bat survey design meets the requirements in Section 8.11 of the Guidelines.	■ The bat study design includes a desktop habitat suitability exercise to locate and identify maternity roosts, foraging areas, dispersal and travel (migration) corridors and hibernacula. ■ This section has been revised to indicate that acoustic surveys will take place in spring (maternity) and fall (swarming). ■ As discussed during the technical discussion on September 11, 2020, methods for bat migration surveys are not currently described in Ontario's guidance document, so potential migration corridors will be identified solely through desktop analysis.	■ Wildlife Study Plan: Section 7.2.2.1

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	following the above stated procedures during the peak swarming period of August 1 to August 31. They will be programmed to commence recording at dusk for five hours for up to 10 nights from August 1 to August 31, or until evidence of bat presence is found, whichever occurs sooner."					
WH-20	■ 4.3.3 Amphibians and reptiles – "Through the course of the field program, any incidental amphibian and reptile encounters will be documented. – The distribution and location, abundance and population status, information on life cycles and movements and habitat requirements of species identified by these practises will be quantified wherever possible." ■ Section 4.3.4 Mammals – "Any mammal species that are likely to be directly or indirectly effected by the activities taking place within the PSA and LSA will be identified. The distribution and location, abundance and population status, information on life cycles and movements and habitat requirements of species identified will be quantified and recorded where possible."	■ Section 8.10 – "identify wildlife species, other than avian species, of ecological, economic or human importance (particularly to Indigenous peoples), within the study area (including moose, rabbit, beavers, otters, muskrat, and frogs), that are likely to be directly or indirectly effected and describe each species: biodiversity, distribution and location; abundance and population status; life cycle; seasonal ranges, migration and movements; habitat requirements; and sensitive periods (e.g., seasonal, diurnal and nocturnal). For the species identified above, describe and quantify the habitat type, including its: function; location; suitability; structure; diversity; relative use, natural inter-annual and seasonal variability, and; abundance as it existed before project construction"	■ It is unclear under what circumstances it would not be possible to provide the required information. ■ It is unclear how baseline data will be collected for amphibians and reptiles that will allow for comparison to the "Expression of Change" listed in Table 6-1 if only incidental observations are being documented. ■ It is unclear how the requirements in Section 8.10 will be met in relation to frogs if only incidental observations are being documented. ■ Additionally, biodiversity, seasonal ranges, migration, movements, sensitive periods and habitat type also need to be described, as per Section 8.10 of the Guidelines.	■ Provide detail to demonstrate that biodiversity, distribution and location; abundance and population status; life cycle; seasonal ranges, migration and movements; habitat requirements; sensitive periods (e.g., seasonal, diurnal and nocturnal) and habitat type will be described for wildlife species, other than avian species, of ecological, economic or human importance (particularly to Indigenous peoples), per Section 8.10 of the Guidelines. ■ Provide information regarding the methods and approaches used for each aspect of the requirement and each species.	■ Amphibian acoustic surveys are proposed as a systematic approach to collect data over space and time during the breeding and non-breeding season. Mammal data analysis methods have been updated to fit requirements of Section 8.10 of the TISG (the Agency 2020a).	■ Wildlife Study Plan: Section 7.2.2, Section 8.2, Section 7.2.3.2, and Section 8.3.
WH-21	■ Section 5.2 Birds – "The number of species detected by different methods at the same time and at the same point will be compared using a multiple regression statistical analysis, such as a Generalized Linear Mixed Model, with survey point ID defined as a subject and various survey methods as repeated measurements. We will compare the number of species detected during breeding bird point counts, breeding bird point counts corrected by a high-quality portable recording device, and ARU performed at the same time. In the model, we will include survey type (breeding bird point counts, breeding	■ Section 8.9 – "Identify the biodiversity metrics, biotic and abiotic indicators that are used to characterize the baseline avifauna biodiversity and discuss the rationale for their selection: • species communities should not be collapsed into diversity metrics or the focus narrowed to indicator species. – Species identity, distribution, abundance and where possible estimates of breeding status should be the primary targets of quantification. • biodiversity metrics for each valued component should include: ○ distribution in space; ○ frequency of occurrence;	■ The study plan does not align with the Guidelines. Differences in species detection based on sampling method should be incorporated directly into the species community modelling.	■ Provide detail to demonstrate how differences in species detection will be incorporated into the species community modelling, as required to be compliant with Section 8.9 of the Guidelines.	■ The Study Plan is updated to include paired sampling from breeding bird point counts and handheld recorders (a surrogate for ARUs) to estimate statistical offsets that correct biases in ARU data relative to human observers. These offsets will be used to calibrate count data by ARUs using the methods of Val Wilgenburg et al. (2017) and Bombaci and Pejchar (2018). For surveys with human observers only, the observer will be added as a covariate in modelling.	■ Wildlife Study Plan: Section 8.1 Birds Study Plan: Section 8

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	bird point counts corrected by a high-quality portable recording device, and ARU), observer, and habitat type. – …. Species diversity in each habitat type will be calculated using the Shannon-Weiner Diversity Index (Shannon and Weaver 1949) during spring migration, the breeding season, and fall migration."	○ patterns of occurrence and abundance in time; ○ abundance and, if possible, density; and ○ associated habitat type(s) and strength of associations."				
WH-22	■ Section 5.2 Birds – "Rare species will be accounted for in the statistical analysis recognizing that they may be more difficult to detect."	■ Section 8.9 – "rare species require more survey effort to detect than common species, and species rarity should be accounted for in survey design by increasing the number and duration of surveys"	■ The survey design must address sampling for rare species. An intention to account for rare species in the statistical analyses does not replace ensuring that sufficient data has been collected via the survey design to enable modeling their abundance and distribution.	■ Provide detail to demonstrate how species rarity has been accounted for in the survey design, as per the requirement in Section 8.9 of the Guidelines.	■ The Study Plan is updated to include two approaches for sampling for rare species in the study design for ARUs. The first is based on a beta diversity analysis / species accumulation curve of preliminary breeding bird data in 2018 which indicated that a sample size of 15 was sufficient to identify rare species. This is used as a general ARU sampling frequency per season (winter, spring migration, breeding, fall migration). The second is specific to rare species identified only through ARUs where scientific literature is available on species-specific detection rates using ARUs (Common Nighthawk, Eastern Whip-poor-will, Yellow Rail). A binomial expansion of these detection rates targeting a 95% cumulative probability of detection is used for these species.	■ Birds Study Plan: Section 7.2.2.
WH-23	■ Section 6.1 <u>Indicators and Expression of Change</u> – [Table 6-1. column Expression of Change]	■ Section 7.1 – "In describing the biophysical environment, the Impact Statement must take an ecosystem approach that considers how the Project may affect the structure and functioning of biotic and abiotic components with the ecosystem using scientific, community and Indigenous knowledge regarding ecosystem health and integrity, as applicable. The Impact Statement must provide a description of the indicators and measures used to determine ecosystem health and integrity, identified during early planning and reflected in the TISG. The presence of habitat, such as but not limited to spawning shoals, aquatic vegetation or overwintering pools, potentially	■ It is unclear whether these are potential mechanisms of change that will not be measured or whether these are responses that will be measured. If these are intended as measured responses, justification for these should be provided, explanations of why more common measures (e.g. relative abundance) are not being used, and detailed explanations of methods should be provided.	■ Provide details to clarify and justify the measures chosen for the expression of change and provide detailed explanations of the methods that will be used.	■ The Study Plan is updated to clearly show that the indicators have been selected and how they were selected. Expressions of change are quantifiable and measurable, and relative abundance has been added as expression of change.	■ Table 9-2

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		affected by the Project should be included in the description of the biophysical baseline conditions."				
WH-24	■ Section 6.1 Indicators and Expression of Change – "The indicators and rationale for selection and measurement of potential effects, to be used to assess and evaluate the alternative routes in the IA / EA are provided in Table 6-1. Breeding Birds (including SAR-olive-sided flycatcher, rusty blackbird and common nighthawk)"	■ Section 8.9 – "the following groups of migratory and non-migratory birds should be considered as valued components: forest birds; raptors; shorebirds; waterfowl; and bog/fen birds, and other wetland birds." ■ Section 15.2 – "analyze predicted effects for all birds, each valued component, and for Bird Conservation Region Priority Species and include relevant effects from Appendix 2 and 3. Include separate analyses for each project activity, component, and phase. Incorporate sources of error for all analyses to insure final impacts estimates show the best available estimate of precision"	■ As valued components, each specified bird group should be included in the effects assessment.	■ Provide detail about the effects assessment methodology for each valued component identified in the Guidelines related to this study plan (birds, wildlife, species at risk).	■ The Study Plan is updated to indicate that breeding birds are categorized into their respective bird group (including species at risk) in the effects assessment. Methods for the effects assessment are described for each group.	■ Birds Study Plan: Table 9-2 and Section 9.2
WH-25	■ Section 6.1 Wildlife Indicators – "Habitat availability and distribution • Survival and reproduction (Population state) • Disruption to breeding behaviour • Fragmentation of habitat • Effects to prey population or access to food • Change in wildlife behaviour (during and after construction) – Change in wildlife mortality (due to increase anthropogenic stressors; hunting, trapping, vehicle travel, etc.)"	■ Section 15.2 – "account for indirect effects such as the increased movement of predators in the predictions of mortality effects"	■ It is unclear if the effects of increased movement of predators in the predictions of mortality effects will be included.	■ Provide detail to demonstrate how the requirement to account for increased movement of predators in the prediction of mortality effects will be addressed, per Section 15.2 of the Guidelines.	■ Predictions of mortality effects from increased predator movements will be estimated using motion sensitive tracking camera data. ■ Pre- construction data of predators and herbivores along planned linear features (i.e., the routes and secondary access roads) will be compared against estimates based on a desktop review to account for increased movement of predators in predictions of mortality effects.	■ Wildlife Study Plan: Section 8.3.4
WH-26	■ Section 6.1 Indicators and Expression of Change – "Effects to SAR will consider potential direct, incidental and cumulative adverse effects of the Project on SAR and, where applicable, its critical habitat." ■ Section 7 Conformance with Federal and Provincial Guidance – "…will be analyzed and addressed in the IA/EA"	■ Section 15.4	■ Section 15.4 of the Guidelines includes additional specific considerations for the effects assessment, as well as considerations when describing potential and predicted effects. ■ It is unclear if all relevant requirements from Section 15.4 of the Guidelines will be addressed for each species at risk.	■ Provide detail to demonstrate that all requirements from Section 15.4 of the Guidelines will be met for all SAR. Describe the methods and approaches taken to meet the requirements for each SAR.	■ The Study Plan has been updated to describe the methods for meeting the requirements in Section 15.4 of the TISG (the Agency 2020a) with respect to data collection and considerations for the effects assessment are generally described for SAR. Specific methods and approaches will be described in greater detail in the IS / EA Report.	■ Wildlife and Birds Study Plans: Section 8 and Section 9.4.2.

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WH-27	■ Section 6.2 Methods for predicting future conditions – "Modelling methods, error estimate and assumption will be reported when possible." ■ Section 6.2.1.3 Model Confidence and Resolution – "That being said, models will be based on best available science and will be thoroughly described including assumptions, calculations of margins of error and other relevant statistical information when possible."	■ Section 7.1 Methodology – "If the baseline data have been extrapolated or otherwise manipulated to depict environmental, health, social and/or economic conditions within the study area, modelling methods must be described and must include assumptions, calculations of margins of error and other relevant statistical information. Models that are developed should be validated using field data from the appropriate local and regional study areas" ■ Section 8.9 – "Provide estimates of confidence or error for all estimates of abundance and distribution. Estimates should be defined (e.g., mean across years, mean across sites, modeled prediction) and, if appropriate, confidence or other intervals should be defined (e.g., 95% confidence intervals, credible intervals). Use of hypothesis testing p - values is generally not appropriate in this context and their use should be justified"	■ It is unclear if estimates of confidence or error for all estimates of abundance and distribution of birds will be provided, as per the requirement in Section 8.9 of the Guidelines. Published studies are unlikely to be sufficient replacement for data collection, data analysis and area specific modeling for this project area. ■ Section 7.1 of the Guidelines requires that modelling methods be described and must include assumptions, calculations of margins of error and other relevant statistical information. ■ It is unclear under what circumstances it would not be possible to provide this information. The Agency would like to reiterate that the Impact Statement is expected to address all requirements from the Guidelines.	■ Provide detail to demonstrate that estimates of confidence and error for all estimates of abundance and distribution of birds will be provided. Ensure that modelling methods, including assumptions, calculations of margins of error and other relevant statistical information are provided for any quantitative model used (including for other wildlife presented in this study plan).	■ The Study Plan is updated to provide the modelling methods, including assumptions, calculations of margins of error and other relevant statistical information for all models proposed for birds and other wildlife.	■ Wildlife and Birds Study Plans: Section 9.4.1
WH-28	■ Section 6.2.1 Wildlife Habitat Development – "HSI models will be developed by gathering background information on wildlife indicators which will be summarized into species accounts, developing wildlife habitat ratings based on this background information, and evaluating the models against field conditions. – HSI models are a simplification of the relationships among environmental parameters and habitat quality based on expert opinion. These models are limited by the extent of knowledge about a species, species-specific habitat use, and the ecosystems. The HSI models developed will be based on the evaluation of ELC units and their assumed relationships to a wildlife VC's habitat suitability in the LSA. That being said, models will be based on best available science and will be thoroughly described including assumptions, calculations of margins of error and other relevant statistical information when possible."	■ Section 7.1 – "If the baseline data have been extrapolated or otherwise manipulated to depict environmental, health, social and/or economic conditions within the study area, modelling methods must be described and must include assumptions, calculations of margins of error and other relevant statistical information. Models that are developed should be validated using field data from the appropriate local and regional study areas." ■ Section 7.2 – "If using existing data sources, the Impact Statement must provide justification to show that the data sources are relevant in spatial and temporal coverage to the Project. Some data sources may have good coverage in Southern Ontario or existing road networks but be unsuitable as a baseline for these northern areas where there are not roads…. – ….Existing data should be considered as a limited augmentation of this new data."	■ It is not clear whether and how collected data will be incorporated into the process described in this section. Qualitative information can often be valuable to augment data but the Guidelines recommends the collection and analysis of study-area specific, quantitative data, using current and accepted quantitative analytic approaches. ■ It should be made clear how assumptions based on published information, much of which is likely to be of limited or unknown relevance to the particular project area, will be sufficiently valid in the absence of quantitatively including collected, local data.	■ Provide details to demonstrate how collected data will be incorporated into the process described in Section 6.2.1 of the study plan. ■ Provide details to demonstrate how the data sources are relevant in spatial and temporal coverage to the Project and how the models will be validated using field data from the study areas, as per the requirements in Sections 7.1 and 7.2 of the Guidelines.	■ The Study Plan is updated to describe how the quantitative, locally collected data will be incorporated in model development and that all data sources will be spatially and temporally relevant to the Project.	■ Wildlife Study Plan: Section 9.4.2

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WH-29	■ Section 6.2.2 Predicted Effects of the Project – "For migratory birds, A Framework for the Scientific Assessment of Potential Project Impacts on Birds (Hanson et al. 2009) will be consulted to assist in analyzing predicted effects for all birds including non-linear, indirect and synergistic responses where possible and applicable. Any assumptions of displacement will be justified with scientific references and best management practices."	■ Section 8.9 – [all content] ■ Section 15.2 – "analyze predicted effects for all birds, each valued component, and for Bird Conservation Region Priority Species and include relevant effects from Appendix 2 and 3. Include separate analyses for each project activity, component, and phase. Incorporate sources of error for all analyses to insure final impacts estimates show the best available estimate of precision;"	■ Based on the information provided in Section 6.2.2 of the study plan, It is unclear if *A Framework for the Scientific Assessment of Potential Project Impacts on Birds* (Hanson et al. 2009) will be consulted to assist in analyzing predicted effects for all birds or migratory birds only. ■ To reliably analyze predicted effects, per Section 15.2 of the Guidelines, baseline data must be designed, collected, and analyzed according to the direction provided in Section 8.9 of the Guidelines. Detailed descriptions of design process and design outcomes (including maps, sample sizes overall and by landcover type) are required to understand and evaluate the design relative to the Guidelines.	■ Provide details to demonstrate that baseline data will be collected according to the direction provided in Section 8.9 of the Guidelines. ■ Generate predictive estimates of abundance (or density/occurrence if justified) across the LSA, PSA, and RSA and provide predictive estimates with associated margins of error at scales that are justified at the scale and shape of the study areas through modelling. Total area may not be an appropriate measure of scale for linear projects that are small scale at any point, but stretch along a large area due to length. Use modelling to predict local effects along the project as well as larger scale patterns along the length of the project. Useful predictions require data inputs from each of the study areas to which extrapolations will be made.	■ The Study plan is updated to show that Hanson et al. (2009) will be consulted for all indicators. This includes detailed descriptions of the design process and outcomes.	■ Birds Study Plan: Section 8
WH-30	■ Section 7 Conformance with Federal and Provincial Guidance – "Outlined as Indicators and Expressions of Change. To be addressed in the IA/EA"	■ Section 15.3 – "describe changes to insects, pollinating species in particular"	■ Section 7 of the study plan states that changes to insects is outlined as indicators and expressions of change. It is not clear how the indicators and expressions of change in Sections 6.1 and 6.2 will enable description of changes to insects.	■ Provide detail to demonstrate how changes to insects will be described, as per the requirement in Section 15.3 of the Guidelines.	■ Changes to insect habitat availability and spatial and temporal distribution will be assessed in the effects assessment.	■ Wildlife Study Plan: Section 8.4 and Section 9.2
WH-31	■ Section 7 Conformance with Federal and Provincial Guidance – "This requirement is partially addressable as: • Overwintering surveys are not feasible as the lower limit of a SM3BAT operating temperature is -20 degree Celsius"	■ Section 8.9 – "Collect bird data to adequately represent the following temporal sources of variation: • among years; • within and among seasons (e.g., spring migration, breeding, fall migration, overwintering); and • within the 24-hour daily cycle."	■ The model noted in the plan text (i.e. SM3BAT) is for bat monitoring and is not suitable for surveying birds. ■ ARUs can be deployed in late winter to provide an index of overwintering bird use of sites. Although extreme cold impair some individual programmed recording events, site use by overwintering birds should not be eliminated from data collection efforts (note 2: Wildlife Acoustics. Climate Change Canada – Landbird Monitoring Along Winter Roads. https://www.wildlifeacoustics.com/customer-stories/climate-change-canada-landbird-monitoring-along-winter-roads)	■ Provide details to demonstrate how overwintering surveys will be conducted, as per the requirements in Section 8.9 of the Guidelines and the information provided in the context column.	■ The Study Plan is updated to indicate that ARUs will be deployed in either early winter (December 1 to December 31) or late winter (March 1 to March 31). ARU bird studies are outlined in detail in the Study Plan to meet section 8.9 of the guidelines with respect to overwintering bird surveys.	■ Birds Study Plan: Section 7.2.2 and Table 7-3

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WH-32	■ Section 7 Conformance with Federal and Provincial Guidance – "The requirement cannot be addressed as: • Project components other than the route itself are unknown at this time"	■ Section 8.9 – "Project components other than the route itself should be sampled. Such components that are linear (e.g., access or service roads) should be surveyed using transects as above. Non-linear components (e.g., aggregate pits) should be surveyed using a grid of sites spaced 250 metres apart and be sufficient to cover the Project component, plus a maximum 3-kilometre buffer. As with transect lengths, modification of buffer width to a minimum of 500 metres may be justifiable if land cover analysis demonstrates no further change in land cover classification with increasing buffer width"	■ A sampling plan was not presented for baseline conditions in relation to service roads, aggregate pits and project components other than the road itself. Information about these project components and sampling plans enable the evaluation of the plans relative to the Guidelines. ■ Section 8.9 of the Guidelines require that project components other than the route itself are sampled. If the exact locations of the other components are not known at this time, the study plan should outline how this requirement will be met once the locations are confirmed. ■ Include potential project components in the study design. For example, Figure 1-2 in document IA#13143E, the detailed project description shows potential sources of aggregate.	■ Provide details to demonstrate how project components, other than the route itself, will be sampled. Include information about the methods and approaches that will be used to address the requirement in Section 8.9 of the Guidelines.	■ Study Plan **Section 6.2** indicates that the PDA encompasses the 100 m wide CAR right-of-way, temporary construction access roads, work areas, worker camps, and long-term aggregate sources and associated access roads. The specific location of Project components, including the roadway, pits and quarries, aggregate source areas and temporary infrastructure, are not yet known and will be included in the IS / EA Report.	■ Birds and Wildlife Study Plans: Section 6.2
WH-33	■ Section 7 Conformance with Federal and Provincial Guidance – "This requirement is partially addressable as: • According to the Atlas of the Breeding Birds of Ontario, the window for the standard breeding surveys (e.g., point counts) in northern Ontario is June 1 to July 10 and in the Hudson Bay Lowlands is June 1 to July 17. • Overwintering surveys not feasible as lower limit of SM3BAT operating temperature is -20 degree Celsius"	■ Section 8.9 – "Regarding "bird sampling"… a) Within each sampling year, ARUs should be deployed at sites as long as possible, with a minimum period of May 1 through July 10 (Breeding Recordings). Use deployments that maximize full use of battery and sound card capacity; b) A subset of at least 50% of the ARU sites should have ARUs deployed to align with periods during which sites are used by birds in fall migration (August 1 through September 30) and during the winter (December 1 through March 31) (i.e., collectively, Fall/Winter Recordings). These fall and winter sites may be a subset of either entire ARU transects or sites along transects but land cover analysis should be used to ensure the subset is an unbiased sample of the population of ARU sites; c) ARU deployments for Breeding Recordings should be programmed to record daily or every 2nd day,	■ Species vary in their peak breeding and detectability periods. Guidelines from the 2nd Ontario Breeding Bird Atlas were intended to focus human surveys within a period of peak breeding by many or most species. Sampling with ARUs should capture the full extent of the breeding period, not only the restricted peak time for most species. ■ Since eskers may serve as migration corridors for many bird species, use ARUs to sample earlier spring and fall periods to provide information on migrating species using the project area.	■ Provide details to demonstrate how sampling with ARUs will be conducted, as per the requirements in Section 8.9 of the Guidelines and the information provided in the context column.	■ The Study Plan has been revised to include ARU deployment during spring migration (April 15-May 31), fall migration (August 1-September 30) and early winter (December 1-December 31) or late winter (March 1-31). Proposed winter sampling is reduced due to temperature limitations of ARU. ■ Planned sampling frequency and analysis proposed during spring and fall migration and early winter (i.e., three 3-minute segments randomly selected from the Morning Period per week) is in line with recommendations in Section 8.9 of the TISG (the Agency 2020a). ■ Specific locations and dates of ARU deployment will be provided at a later date.	■ Birds Study Plan: Section 7.2.2.4

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		with a morning and an evening schedule. Recording should occur in two phases to avoid single recordings spanning two dates. Phase 1 would start at 00:00 (HH:MM), with a schedule of 3-minutes On and 12-minutes Off until 5 hours beyond local sunrise (i.e., SR+5hr). Phase 2 would start 30 minutes before local sunset, with a schedule of 3-minutes On and 12-minutes Off until 23:56 (HH:MM); d)ARUs should be set to record using a sampling rate of 44.1 kHz."				
WH-34	■ Section 7 Conformance with Federal and Provincial Guidance – "Data will be collected in ways that enable reliable extrapolations in space and in time. Surveys will be destined to represent the spatial and temporal targets of modeling and extrapolations… – Sample size will be planned to support evaluation of the project within the context of the local study area and regional study area. Study designs will implement multiple survey locations to cover multiple habitat classes and land cover types…. – Survey design sampling effort will be most intense within the project study area. Efforts outside the PSA will be carefully implemented to remove biases when comparing areas from within the PSA."	■ Section 8.9 – "Collect data in a manner that enables reliable extrapolations in space (i.e., at minimum to Project, local and regional study areas) and in time (i.e., across years): • design surveys so that they represent the spatial and temporal targets of modeling and extrapolations, and to produce scientifically defensible predictions of impacts and estimates of mitigation effectiveness. Survey designs should be sensitive enough to detect and quantify the impacts at the spatial and temporal scales identified above (i.e., project study area, local study area, and regional study area), any departures from predictions, and the effectiveness of mitigations. Justify the selection of modeling techniques based on current and recent scientific literature; Sample size must be planned to support evaluation of the project study area within the context of the local study area and regional study area. – Appropriate design of surveys will need to consider multiple survey locations in order to represent the habitat heterogeneity of the regional study area, and to yield multiple survey locations per land cover or habitat	■ Information provided in the study plan is not sufficient to verify the assertion that data will be collected in ways that enable reliable extrapolations in space and time, and represent the spatial and temporal targets of modeling and extrapolations. ■ Detailed descriptions of design process and design outcomes (including maps, sample sizes overall and by landcover type) are required to understand and evaluate the design relative to the Guidelines. Following this approach should lead to a detailed platform for evaluating the sufficiency of the selected design, for communicating the rationale for choosing that design, and for communications regarding clarifications, suggestions and recommendations.	■ Provide specific details to demonstrate how the data collection design incorporates and addresses the requirements in Section 8.9 of the Guidelines.	■ The Study Plan is updated to provide the modelling methods, including assumptions, calculations of margins of error and other relevant statistical information for all models proposed for birds and other wildlife.	■ Wildlife and Birds Study Plans: Section 7 and Section 9.4.1

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		class, without requiring aggregation of habitat classes post-hoc; Sampling effort per unit area - field survey effort should be most intensive within the project study area. The level of effort per unit area may be similar or somewhat less within the remainder of the local study area but should be scaled to the likelihood that project effects will impact birds within that zone. Efforts outside the project study area should be carefully designed to ensure that estimates comparing within and across the project study area, local study area and regional study area are unbiased and as precise as possible;"				
WH-35	■ Section 7 Conformance with Federal and Provincial Guidance – "A point count survey location will be conducted within each vegetation community identified for Ground Investigations, within 1 km of helicopter landing pads. Study design will not implement point count survey sites along 5 km long transects for the following reasons: • Length of transect not reasonable / feasible method given landscape (e.g., dense forest, blow down, water features, etc.) and field staff health and safety considerations, • Evenly space transects conflicts with randomized selection of habitats or if specific (i.e., rare habitats are to be targeted)."	■ Section 8.9 – "design suggestions for Project Study Area and Local Study Area scales: • Use a standardized design approach during survey planning. The resulting design details will serve as the basis to develop alternative designs, evaluate options for particular design details, and to identify potential efficiencies. The approaches and tools suggested elsewhere in this document (e.g., land cover analysis, data simulations) should be considered during the planning phase. The following should be considered as inputs to design planning and evaluation; • transects and sites: ○ transects should be spaced every 2 kilometers along the route, oriented perpendicular to the route, and with the mid-point of each transect located on the centerline of the route. A maximum length of 5 kilometers is likely suitable for sampling most habitat types, including those associated with eskers and similar linear features in alignment with the route. Transect lengths less than 5	■ The suggested design was offered as a foundation for modification, with justifications. Adjustments of suggested design are anticipated and application of proponent-held knowledge and information is likely necessary for those adjustments. ■ Adding bird counts to a Vegetation Study design is unlikely to address the bird information needs described in the Guidelines. ■ Remote fieldwork can often be challenging but can be done safely. Direct and recent field experience by the reviewers and colleagues indicates that it is feasible to deploy acoustic recorders at remote locations that have been pre-selected according to a random, spatially dispersed design. With helicopter drop-offs and overland travel, crews have deployed acoustic recorders on and across eskers, in peatlands, and at forest sites in remote parts of northern Ontario, including in the ecoregions of interest here. With some additional constraints (e.g. daylight, weather) this is also possible to do for bird point counts.	■ Provide detail to demonstrate how the design suggestions in Section 8.9 of the Guidelines were used a basis to develop alternative designs in the study plan. Provide rationale for any modifications.	■ Planned sampling frequency and analysis proposed during spring and fall migration and early winter (i.e., three 3-minute segments randomly selected from the Morning Period per week) is in line with recommendations in section 8.9 of the Guidelines (page 54).	■ Birds Study Plan: Section 7

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		kilometers may be suitable but should be justified with respect to an analysis of land cover that demonstrates no further change in land cover composition with increasing distance from the intersection of route and transect mid- point"				
WH-36	■ Section 7 Conformance with Federal and Provincial Guidance – "Wildlife data will be collected to represent temporal sources of species variation (i.e. among years, among seasons and within 24 periods)'	■ Section 8.10 – "Collect wildlife data to represent the following temporal sources of variation: • among years • Within and among seasons (e.g., spring dispersal, breeding, late summer/fall migration and swarming, hibernation); and • Within the 24-hour daily cycle. Rare species require more survey effort to detect than common species, and this needs to be accounted for in survey design by increasing the number and duration of surveys."	■ More information is needed on the timing of surveys outlined in Section 4.3 to determine whether variation among years and seasons is represented.	■ Provide a schedule for all surveys to be conducted along with detailed survey designs that demonstrates how temporal variation requirements for wildlife data collection would be met, per Section 8.10 of the Guidelines.	■ The Study Plan has been updated with timing information, where available. Further information regarding future sampling locations and dates will be provided in the future Work Plan.	■ Wildlife Study Plan: Table 7-1 and Table 7-2 ■ Birds Study Plan: Table 7-3, Table 7-4, and Table 7-5.
WH-37	■ Section 7 <u>Conformance with Federal and Provincial Guidance</u> – "Section 4.3.1.3?"	■ Section 8.9 – "describe the use of (magnitude, timing) migratory and non-migratory birds as a source of country foods (traditional foods) or where use has Indigenous cultural importance (e.g., Canada Goose, Snow goose, Swans, Gyrfalcon, Loon, Peregrine Falcon, and duck species)"	■ It is unclear how or if the use of migratory and non migratory birds as a source of country foods and species that have Indigenous cultural importance will be described. ■ Note: Table 7.1 has this requirement listed, but the "response" section is blank. Additionally, the referenced section in the study plan has a question mark, which may be an editorial error. However, there is no mention of country foods in the section that is referenced.	■ Provide detail to demonstrate how use of migratory and non migratory birds as a source of country foods and species that have Indigenous cultural importance will be described. Include information about the methods and approaches that will be used to meet the requirement in Section 8.9 of the Guidelines. ■ Update table 7.1 to include a response to section 8.9 TISG requirements.	■ Specific locations and dates of ARU deployment will be provided at a later date.	■ Birds Study Plan: Section 7.2.1
WH-38	■ Section 7 Conformance with Federal and Provincial Guidance – "Long- and short-term habitat changes and food sources of wetland fauna will be described and documented including changes in terms of the health, integrity and availability of habitats related to wildlife, migratory and non-migratory birds"	■ Section 15.2 – "describe short term and long term changes to habitats and food sources of migratory and non-migratory birds (types of cover, ecological unit of the area in terms of quality, quantity, distribution and functions), with a distinction made between these two birds categories, including losses, structural changes and fragmentation of riparian habitat (aquatic grass beds, intertidal marshes), terrestrial	■ It is unclear how all aspects of the requirement in Section 15.2 of the Guidelines will be met. The information provided in Section 7 only refers to wetlands, but the Guidelines require that riparian and terrestrial environments be described as well.	■ Provide detail to demonstrate how all aspects of the requirement in Section 15.2 of the Guidelines will be included in the effects assessment.	■ Long- and short-term habitat changes and food sources of fauna will be described and documented including changes in terms of the health, integrity and availability of habitats related to wildlife, migratory and non-migratory birds.	■ Birds and Wildlife Study Plans: Section 9.4.2

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		environments (e.g., uplands, grasslands, forested, old growth, post fire) and wetlands frequented by birds. Describe changes in terms of the health, integrity, and availability of habitats. Important habitats to consider include eskers, (and similar upland features), forest, riparian, bog/fen/peatlands, other wetlands, and open water;"				
WH-39	■ Section 7 Conformance with Federal and Provincial Guidance – "Will be accounted for in the IA/EA – The expressions of change to newly created habitat through the activities of the project will be described in the IA/EA"	■ Section 15.2 – "Account for changes in detection pre- and post-project construction. For instance, roads allow for greater detection distances and therefore any estimates of abundance or presence need to account for differential detectability; describe the effects caused by the new habitat types created in the project area by clearing vegetation. – The new habitats created may attract migratory birds, which were not present before (such as the Eastern Whip-poor-will or the Common Nighthawk). Describe how these species at risk may be impacted by the project."	■ There is not enough information provided to determine if the requirements in Section 15.2 of the Guidelines will be met. There is no discussion about methodologies or studies that will take place.	■ Provide detail in the study plan to demonstrate the proposed approaches and methods to be used to integrate the requirements from Section 15.2 of the Guidelines into the assessment.	■ Post-construction survey requirement will be determined based on the results of the IA / EA, and changes in detectability will be accounted for in the IS / EA Report if impacts are determined.	■ Birds Study Plan: Table 11-3
WH-40	■ Section 7 Conformance with Federal and Provincial Guidance – "Biodiversity metrics for the Wildlife VC will consider: • Distribution in space; Frequency of occurrence; Patterns of occurrence and abundance in time; Abundance and, if possible, density; and Associate habitat types and strength of associations"	■ Section 15.3 – "describe effects to terrestrial wildlife biodiversity considering biodiversity metrics, effects of habitat fragmentation, changes to regional biodiversity"	■ It is unclear how the effects of fragmentation on terrestrial wildlife biodiversity and changes to regional biodiversity will be studied.	■ Provide further detail to demonstrate how changes to regional biodiversity and the effect of fragmentation on terrestrial wildlife biodiversity will be described, as per the requirements in Section 15.3 of the Guidelines.	■ The Study Plan is updated to describe how the effect of fragmentation on biodiversity metrics will be examined pre- and post-construction at the PDA and LSA level.	■ Birds and Wildlife Study Plans: Section 9.4.1.2, 9.4.2

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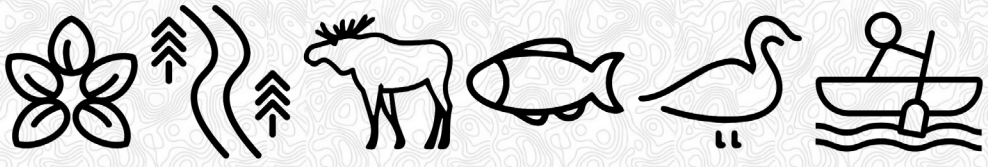

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1	■ Page 2, s. 2 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ Key objectives of conducting an EA include the elements mentioned in the work plan and also describing the existing environment, describing potential effects (positive and negative) of the project and alternatives, and consult about the project.	■ Suggest the following revisions to add additional key objectives of the EA process: – *The key objectives of conducting an IA / EA are to describe the existing environment, gather sufficient information to predict Project-related effects (positive and negative) of the project and alternatives on the environment, ~~on Ungulates (moose and woodland caribou) and~~ determine measures needed to avoid or minimize adverse Project effects and enhance beneficial Project effects where feasible, and undertake consultation.*	■ Changes made.	■ Birds and Wildlife Study Plans: Section 2
2	■ Page 2, footnote – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ The footnote is appreciated though requires clarification. Will the study plans be updated to reflect any other comments during the ToR review process or post-ToR, e.g. federal, Indigenous, public?	■ Please clarify if the study plans will be included with the ToR submission. ■ If not included in the ToR submission, please clarify if and when the project team intends to consult broadly on the work plans. The footnote should also be revised to state that the study plans will be updated to reflect the approved ToR if approval is obtained.	■ The Study Plans will not be included with the ToR submission. They have considered public, agency, and Indigenous input received on the Project to date. Government agencies, interested persons, and Indigenous communities will have the opportunity to comment on components of the study plans throughout the IS / EA Report consultation and engagement process. Further details have been provided in Section 3 of the Study Plans. ■ The revision regarding the footnote has been incorporated into the updated Study Plan.	■ Birds and Wildlife Study Plans Section 4 and Section 5
3	■ Pages 6-7, Figures 3-1 and 3-2 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ Figures 3-1 and 3-2 are missing locations for other project infrastructure – can this be added to the maps?	■ Please add locations of other project infrastructure and associated study areas to Figures 3-1 and 3-2, or clarify when these locations will be known.	■ As noted in **Section 6.2** of the Study Plan "The specific location of Project components, including the roadway, pits and quarries, aggregate source areas and temporary infrastructure, are not yet known and will be included in the IS / EA Report. While most of the Project components are expected to be located within the preliminary 5 km wide study area, benefits (e.g., reduced environmental disturbance, avoidance of sensitive features, technical considerations, concerns received through consultation) for locating Project components on lands outside of the 5 km wide study area may become known during the IA / EA process. If the need to locate Project components outside the 5 km wide study area is determined to be required or of benefit to the Project, the study area would be adjusted."	■ Birds and Wildlife Study Plans: Section 6.2
4	■ Page 27, Table 6-1	■ MECP, Environmental Assessment Branch	■ Minor typo in the 2nd row, 3rd column: “Little **Brow** Myotis.”	■ Fix typo.	■ Typo addressed.	■ Wildlife Study Plan: Table 2-1

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5	■ Page 28, s. 6.2	■ MECP, Environmental Assessment Branch	■ Minor typo in 1st paragraph of section 6.2: “The IA/EA will provide describe the anticipated activities..."	■ Fix typo.	■ Phrase has been removed.	■ No Reference
6	■ Page 30, s. 6.3 – Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ A few comments on the first paragraph: – It is stated that project phases include construction and operation. It would be helpful if this section clarifies that the construction phase includes decommissioning of temporary infrastructure, per page 14 of the draft ToR. – Residual effects are mentioned but not explained. For clarity, there should be a statement that residual effects (net effects using provincial language) are the effects left over after application of impact management measures, per Ontario’s EA Code of Practice. – The paragraph states the residual effects will “be described in terms of the magnitude, geographic extent, **timing, duration,** frequency, **social and ecological context,** likelihood, and whether effects are reversible or irreversible.” These characteristics are not all the same as what was stated in the draft ToR: “direction, magnitude, geographic extent, direction [sic], frequency, reversibility and likelihood” (p. 54-55 of draft ToR). Bolded font added to show differences. The remainder of section 6.3 describes further effects assessment methodology. The work plan and final ToR should align in methodology.	■ Please add to this section that the construction phase includes decommissioning of temporary infrastructure, using consistent language as the ToR. ■ Please add to this paragraph that ‘residual (net) effects are the effects remaining after the application of impact management measures.’ ■ Please align the work plan methodology with the final ToR methodology in terms of assessing effects and alternatives, or provide sufficient rationale if methodologies are different. Per Ontario’s EA Code of Practice, the evaluation method(s) chosen must be able to produce an assessment that is clear, logical and traceable.	■ The requested revisions have been made.	■ Birds and Wildlife Study Plans: Section 6.1 and Section 9.6.
7	■ Indigenous knowledge Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ The work plan indicates that the EA will consider Indigenous knowledge to inform the effects assessment. The work plan does not provide a proposed methodology for how the proponent intends to seek Indigenous knowledge, from whom, and how it will be incorporated.	■ Please provide further details about how Indigenous knowledge will be collected and incorporated. Alternatively it may be helpful to include a reference to the relevant components of the ToR and ToR consultation plan that provide further details.	■ As identified in **Section 4.2** of the Study Plan, the Proponent will provide opportunities for consultation and engagement with Indigenous communities identified in **Table 4-1**, which is inclusive of all Indigenous communities identified in the Indigenous Partnership and Engagement Plan for the Marten Falls Community Access Road Project Impact Assessment (the Agency 2020a). ■ Further information on how Indigenous Knowledge will be considered in the IS / EA Report has been included in **Section 5** of the Study Plan. **Section 5** of the Study Plan provides further details on the two concurrent and complementary avenues for Indigenous communities and groups to be engaged with and provide input on the Project: the Indigenous Knowledge Program and the Consultation and Engagement Program.	■ Birds and Wildlife Study Plans: Section 4 and Section 5

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8	■ Criteria and indicators table ■ Same comment in Wildlife, Ungulates and Vegetation work plans	■ MECP, Environmental Assessment Branch	■ For the tables containing criteria and indicators, some work plans include the three columns Valued Component, Indicators and Rationale for Selection. Other work plans include the columns Indicator, Expression of Change and Rationale for Selection. The table formats of criteria and indicators should be consistent across work plans. ■ There are also differences between the criteria/indicators in the draft work plans vs. the criteria and indicators in the draft ToR	■ Please review draft work plans to achieve consistent format in how criteria and indicators are presented in the tables. ■ Where there are differences between the criteria/indicator tables in the draft work plans and the draft ToR Appendix A, please ensure the work plans and final ToR align so that the assessment methodology is consistent and to avoid confusion.	■ Study Plans have been updated to ensure consistent format in how criteria and indicators are presented. ■ The criteria and indicators have evolved through input from Indigenous communities, government agencies and interested stakeholders and will continue to do so. The starting point for the criteria/indicator tables in the updated Study Plans was Appendix A of the Proposed ToR. However, there are a few circumstances where agency comments were provided on criteria/ indicators following the finalization of the Proposed ToR and so there are a few circumstances where the criteria/indicators included in the updated Study Plans deviate slightly from that provided in Appendix A of the Proposed ToR.	■ Birds and Wildlife Study Plans: Section 9
9	■ Pg. 4 / Table 3-1	■ MECP, Species At Risk Branch	■ Limited rationale has been provided to substantiate the use of tertiary watersheds to define the Regional Study Area (RSA). The identification of the RSA for Wolverine should be based on Wolverine specific considerations, such as their geographic extent within and across the study areas (e.g., broad use of large landscapes, etc.). This may also include consideration of ecosystem-based considerations relevant to Wolverine (e.g., ecoregions/ecodistricts, Wildlife Management Units, etc.) where appropriate. If watersheds are to be used to identify the RSA, appropriate rationale/ justification needs to be included describing their relevance to Wolverine.	■ Update the draft Work Plan to provide appropriate rationale that supports the use of tertiary watersheds for Wolverine.	■ The Wolverine RSA has been updated to include all WMUs that intersect the Wolverine LSA. The rationale for this selection has been provided in the Study Plan.	■ Wildlife Study Plan: Section 6.2
10	■ Pg. 9 – 10 / s.4.1.1.2 – ■ Crepuscular Bird Acoustic Surveys	■ MECP, Species At Risk Branch	■ Insufficient information is provided on the number and areas of potential habitat that were identified and surveyed for Eastern Whip-poor-will.	■ Update the draft Work Plan to include a map of the potential habitat that was identified and surveyed for Eastern Whip-poor-will.	■ The requested revision has been made.	■ Birds Study Plan: Figure 7-2
11	■ Pg. 10	■ MECP, Species At Risk Branch	■ Document states “ARUs recorded data for two hours starting 30 minutes after sunrise…” – given that the species being targeted (Whip-poor-will and Common Nighthawk) are crepuscular, was this meant to say..”for two hours starting 30 minutes after sunset..”?	■ Correct typo or provide rationale for timing of acoustic studies meant to target crepuscular bird species	■ Changes made.	■ Birds Study Plan: Section 7.2.2
12	■ Pg. 10 / s.4.1.1.2 – 2019 Golder Bird Survey (Crepuscular Bird Acoustic Surveys)	■ MECP, Species At Risk Branch	■ Document states “This survey program is based on the Ontario Ministry of Natural Resources and Forestry’s (MNRF) Draft Survey Protocol for Eastern Whip-poor-will in Ontario (2014)” however the MNRF protocol does not speak to this method of survey (i.e. the use of acoustic song-meters in lieu of point counts). The use of acoustic song-meters is not typically a recommended approach given the difficulties associated with triangulating calls and thus determining locations of calling Whip-poor-will and delineating breeding territories.	■ Update the draft Work Plan to appropriately acknowledge that only some aspects of the referenced survey protocol were used and provide rationale describing why the full draft protocol was not followed.	■ The Study Plan has been updated to include language to show which parts of protocols were followed.	■ Birds Study Plan: Section 7.2.2.5

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13	■ Pg. 10 / s.4.1.1.2 – 2019 Golder Bird Survey (Crepuscular Bird Acoustic Surveys)	■ MECP, Species At Risk Branch	■ Regarding the selection of segments from the ARUs – no mention of selection of periods based on their proximity to full moon occurrence, which is one of the most important criteria when conducting surveys for Whip-poor-will. It is recommended that proximity to full moon be a primary consideration in the selection of ARU segments.	■ Update the draft Work Plan to provide rationale for selection of segments from the ARUs, including, but not limited to, proximity to full moon, moon illumination, weather, etc.	■ The Study Plan has been updated to include a rationale for selection of ARU segments when conducting surveys for Whip-poor-will.	■ Birds Study Plan: Section 7.2.2.5
14	■ Pg. 10 / s.4.1.1.2 – 2019 Golder Bird Survey (Crepuscular Bird Acoustic Surveys)	■ MECP, Species At Risk Branch	■ No mention of the results of the surveys for Whip-poor-will are included. Considering an appropriate survey protocol was not followed, if no birds were heard, these results may be deemed inconclusive and additional surveys may be required to accurately confirm presence.	■ Update draft Work Plan to include results of surveys conducted to date.	■ The results of previous surveys will be provided at a later date.	■ No Reference
15	■ Pg. 10 / s.4.1.1.2 – 2019 Golder Bird Survey (Bank Swallow and Barn Swallow)	■ MECP, Species At Risk Branch	■ Document states that areas of potential suitable habitat identified from the air were surveyed on the ground, wherever access permitted (i.e., within proximity to a safe helicopter landing location). However, no definition is provided on what distance was considered to be 'within proximity'. Were areas of potential habitat excluded from ground surveys because they were deemed to be too far away from a safe helicopter landing location?	■ Update draft Work Plan as appropriate.	■ The Study Plan has been updated to specify "within proximity" to mean within 1-km from a helicopter landing location.	■ Birds Study Plan: Section 7.2.2.3
16	■ Pg. 10 / s.4.1.1.2 – 2019 Golder Bird Survey (Bank Swallow and Barn Swallow)	■ MECP, Species At Risk Branch	■ Document states that no habitat or potential habitat of Bank Swallow or Barn Swallow were identified within the LSA. It is unclear if this conclusion was made during the desktop exercise using aerial imagery to identify features, and therefore no ground surveys actually took place; or whether the desktop exercise resulted in the identification of potential habitat that was subsequently surveyed from the ground and determine to not be used/occupied.	■ Update the draft Work Plan to clearly indicate whether the conclusion the no potential Barn Swallow or Bank Swallow habitat is present in the LSA was a result of the desktop exercise or the aerial/ground surveys. ■ If this conclusion was based on the desktop exercise, update the draft Work Plan to clearly indicate that aerial/ground surveys were not conducted.	■ The Study Plan has been updated to indicate that the conclusion of no potential Barn Swallow or Bank Swallow habitat present in the LSA was based on desktop review and aerial / ground surveys. Additional results of previous surveys will be provided at a later date.	■ Birds Study Plan: Section 7.2.2.3
17	■ Pg. 10 / s.4.1.1.2 – 2019 Golder Bird Survey (Bank Swallow and Barn Swallow)	■ MECP, Species At Risk Branch	■ No mention of the results of the surveys for Barn Swallow or Bank Swallow are included in the draft Work Plan. Considering the results concluded that no potential Bank Swallow and Barn Swallow habitat were identified within the LSA, the results of the desktop exercise and/or areas searched by air/ground are required to determine if additional surveys may be required to accurately confirm presence.	■ Update draft Work Plan to include results of surveys conducted to date.	■ The results of Golder's field reconnaissance were added to the study plan showing that no habitat was identified. Additional results of previous surveys will be provided at a later date.	■ Birds Study Plan: Section 7.2.2.3
18	■ Pg. 11 / s.4.1.2.1 – 2019 Golder Bat Surveys	■ MECP, Species At Risk Branch	■ The draft Work Plan identifies that Acoustic Monitors were deployed at 167 stations within the LSA, but further describes that data was collected from 15 stations. Is there an error in the reported number of stations acoustic monitors were deployed or in the reported number of stations that data was collected from?	■ Update draft Work Plan accordingly.	■ Changes made.	■ Wildlife Study Plan: Section 7.2.2.2.2
19	■ Pg. 11 / s.4.1.2.1 – 2019 Golder Bat Surveys	■ MECP, Species At Risk Branch	■ Insufficient details are provided regarding the number and placement of acoustic monitors. The draft Work Plan only indicates that final bat acoustic station locations were identified in the field based on suitable habitat and proximity to safe helicopter landing locations. Additional detail on the selected locations and placement of acoustic monitor locations (e.g., candidate roost trees, snag tree density, surrounding objects, height, etc.) is required to confirm appropriate placement and whether additional surveys may be required to accurately confirm presence.	■ Update draft Work Plan to include additional details regarding the location (i.e., maps) and specific placement of acoustic monitors for surveys conducted to date.	■ The Study Plan has been updated to include a map of bat ARU placement in support of the study design. A description of the habitat at ARU sites will be provided at a later date. Additional bat acoustic monitoring survey locations will be outlined in the upcoming work plan.	■ Wildlife Study Plan: Section 7.2.1.2.2.

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20	■ Pg. 11 / s.4.1.2.1 – 2019 Golder Bat Surveys	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that acoustic monitors were deployed between Jun 13-17, 2019 and retrieved between Sept. 2-4, 2019. Acoustic monitors should be deployed throughout the maternity period (May 1 to August 31) and swarming period (August 1 to September 30) to provide sufficient information to quantify baseline bat activity and evaluate habitat use (i.e., maternity roosting, foraging, travel, swarming).	■ Update the draft Work Plan to address how all aspects of bat activity and habitat use will be addressed.	■ No bat hibernacula habitat was identified, so data was not collected during the swarming period. Future surveys will occur for at least 10 days between June 1 and June 30 in appropriate maternity habitat and from August 1 to August 31 if potential hibernacula are identified.	■ Wildlife Study Plan: Section 7.2.1.2.2 and 7.2.1.2.3
21	■ Pg. 11 / s.4.1.2.1 – 2019 Golder Bat Surveys	■ MECP, Species At Risk Branch	■ Notwithstanding previous comments, bat roosts in forested environments are particularly difficult to identify without more intensive methods (i.e., trapping and attaching transmitters). Bats are also known to shift roost locations. As such, where existing evidence already confirms presence of SAR Bats (Little Brown Myotis, Northern Myotis, Tri-Coloured Bat) it can be assumed that bats will be roosting in certain forest types based on stand composition and tree characteristics (i.e., cavities, crevices, cracks, loose bark, etc.).	■ No action required.	■ Comment noted.	■ No Reference
22	■ Pg. 11 / s.4.1.2.1 – 2019 Golder Bat Surveys	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that, based on a desktop review of the Abandoned Mine Information System (AMIS) and subsequent field surveys, no potential hibernacula were identified. Considering these results, it is reasonable to assume that there are no hibernacula present.	■ No action required.	■ Comment noted.	■ No Reference
23	■ Pg. 10-11 / s.4.1.2.1 – 2019 Golder Bat Surveys	■ MECP, Species At Risk Branch	■ No mention of the results of the 2019 bat surveys are included in the draft Work Plan and no initial conclusions are presented (e.g., presence/absence of SAR bats, etc.).	■ Update draft Work Plan to include results of surveys conducted to date.	■ The results of previous surveys will be provided at a later date.	■ No Reference
24	■ Pg. 11-12 / s.4.1.4 – Wildlife Cameras	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that 21 wildlife cameras were deployed across the LSA. No information on the intended purpose of these cameras is provided (e.g., habitat use, presence/absence, abundance, etc.) and no results are presented. It is unclear what these were intended to inform and/or how this information will be used. Additional details on methodology and intended application are required.	■ Update draft Work Plan to include additional details on methodology, intended purpose and results of surveys conducted to date.	■ The requested revision has been made. The results of previous surveys will be provided at a later date.	■ Wildlife Study Plan: Section 7.2.3.2.4 and Section 8.3.4.
25	■ Pg. 11-12 / s.4.1.4 – Wildlife Cameras	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that the wildlife cameras were deployed between mid-June to early September. Depending on the intended application of this data (e.g., abundance, presence/absence) this is insufficient to adequately identify habitat use across seasons and across years for Boreal Caribou and Wolverine.	■ Pending additional information on intended application of wildlife cameras, additional data collection with wildlife cameras may be required.	■ Motion sensitive cameras will be used to estimate the seasonal distribution, abundance, and density of mammals (including Caribou and Wolverine) in the LSA among years. Surveys completed in 2019 are intended to represent one year of data, an additional year of data is proposed in the Study Plan.	■ Wildlife Study Plan: Section 7.2.3.2.4
26	■ Pg. 12 / s.4.3 – Study Methods	■ MECP, Species At Risk Branch	■ It is identified that the following study methods have been designed to support addressing elements of the TISG as well as implementing survey protocols that may be identified for Critical Habitat under the Schedule of Studies as outlined in various SAR recovery strategies that exist for species protected under SARA. It is recommended that the study methods be designed to also consider provincial direction (i.e., recovery strategies, government response statements, general habitat descriptions [GHD's], etc.) ensuring specific reference is made to appropriate policy and guidance documents.	■ Update draft Work Plan accordingly.	■ The Study Plan has been updated to include the following: " The following study methods have been designed to address elements of the TISG required for field investigations... recovery strategies that exist for species protected under SARA (Environment Canada 2015; Environment Canada 2016), provincial recovery strategies (Ontario Wolverine Recovery Team. 2013, Humphrey and Fotherby 2019), government response statements (MECP 2020; MNRF 2016), and General Habitat Descriptions (MNR 2017)."	■ Birds and Wildlife Study Plans: Section 7.2

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27	■ Pg. 13 / s.4.3.1.1 – Field Study Design	■ MECP, Species At Risk Branch	■ Insufficient information is provided regarding the number of sampling plots that will be established to survey for Eastern Whip-poor-will (i.e., number of ground survey stations / number of ARU stations in Eastern Whip-poor-will habitat) (see comment #20).	■ Update the draft Work Plan to clearly identify the number of survey stations that will be established for Eastern Whip-poor-will.	■ The Study Plan has been updated to include a map of ARU station locations. Additional survey locations will be provided in the upcoming work plan.	■ Birds Study Plan: Figure 7-1
28	■ Pg. 13 – 14 / s.4.3.1.1 – Field Study Design	■ MECP, Species At Risk Branch	■ Insufficient information is provided regarding the number of Ground Investigation sites. Several components of the proposed Wildlife Work Plan reference the Ground Investigation sites (e.g., Bat ARU stations, Wolverine Hair Snag Traps, etc.), however without understanding the number and distribution of these sites, it is difficult for MECP-SARB to provide appropriate comments on the adequacy of proposed surveys.	■ Update the draft Work Plan to clearly identify the number of Ground Investigation sites that will be established.	■ The Study Plan has been updated to indicate the number of Bat ARU stations and Wolverine hair snags and general distribution. Survey locations will be provided in the upcoming Work Plan.	■ Wildlife Study Plans: Sections 7.2.1.2.2 and 7.2.3.2.5
29	■ Pg. 16 / s.4.3.1.5 – Autonomous Recording Unit (ARU)	■ MECP, Species At Risk Branch	■ Ideally, MNRF's 2014 Draft Survey Protocol for Eastern Whip-poor-will should be followed as opposed to deployment of ARUs. However, if ARUs must be used, they should be set to record during a period when the moon is greater than 50 percent illuminated in order to maximize chances of catching calling individuals. If Whip-poor-will are captured during ARU deployment, how will their presence (and lack of ability to triangulate their location) as well as habitat be mapped?	■ Update the draft Work Plan to clearly describe how the application of ARUs will be used to inform the EA.	■ The requested revisions have been made to the updated Study Plan.	■ Birds Study Plan: Section 7.2.2.5 and Section 7.2.2.7
30	■ Pg. 17 – 18 / s.4.3.1.8 – Data Collection	■ MECP, Species At Risk Branch	■ Sufficient samples of ARU data specific to Eastern Whip-poor-will should be provided and rationalized. ARU data should be sampled during appropriate timeframes/conditions for Eastern Whip-poor-will (i.e., 30 minutes before sunset to 30 minutes after sunrise, during a period when the moon is greater than 50 percent illuminated, etc.) to maximize the chances of identifying calling individuals.	■ Update the draft Work Plan to clearly describe and rationalize the number of samples for Eastern Whip-poor-will and the criteria for selection.	■ The Study Plan has been updated to include a description of the ARU sampling strategy for Eastern Whip-poor-will based on binomial expansion of published detection rates during the time periods identified in the comments.	■ Birds Study Plan: Section 7.2.2.4 and Section 7.2.2.5
31	■ Pg. 18 / s.4.3.2 – Bats	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that Little Brown Myotis and Northern Myotis are known to have roosting habitat within the RSA. Recent evidence from Layng et al., 2019 identified Tri-colored Bat within the general vicinity of the Project. As such, the potential for this species to be present within the PSA, LSA and/or RSA cannot be ruled out. The draft Work Plan should clearly indicate how this species at risk will be considered.	■ Update draft Work Plan accordingly.	■ The Study Plan has been updated to include the Tri-colored bat.	■ Wildlife Study Plan: Table 2-1 and Section 7.2.1
32	■ Pg. 18 / s.4.3.2.1 – Habitat Identification	■ MECP, Species At Risk Branch	■ The referenced document (Bats and Bat Habitat: Guidelines for Wind Power Projects) was published in 2011, not 2019. ■ It is recommended that bat habitat be identified using direction provided in the draft Technical Note Species At Risk (SAR) Bats (2015) as this provides additional and up-to-date information.	■ Correct reference year ■ Update draft Work Plan to reflect that the draft Technical Note will be used to identify suitable bat habitat.	■ The requested revision has been made to the updated Study Plan.	■ Wildlife Study Plan: Section 7.2.1.1
33	■ Pg. 18 / s.4.3.2.1 – Habitat Identification	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that field surveys will be used to confirm bat habitat presence in high potential areas. It also indicates that the habitat suitability exercise will inform the locations of the acoustic surveys which will be designed to locate and identify high value habitat features such as maternity roosts, foraging areas and hibernacula. ■ As mentioned, the survey methods presented are reasonable approaches to identify presence/absence and general bat activity. However, while the identification of 'high potential' or 'high value' habitat can potentially inform appropriate locations to deploy acoustic monitors, assessment of impacts should consider all potential habitat.	■ Update the draft Work Plan to clarify that the acoustic surveys target 'high potential' habitat, as identified through the habitat identification exercise, is intended to inform presence/ absence and general bat activity for comparative purposes to inform the location of the road within the LSA and an assessment of impacts; and not to identify high/low quality habitat.	■ The Study Plan has been updated to clarify that acoustic surveys will target "high potential" bat habitat rather than "high quality" bat habitat.	■ Wildlife Study Plan: Section 7.2.1 and Section 8.1

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			Bat roosts in forested environments are particularly difficult to identify without more intensive methods (i.e., trapping and attaching transmitters). Bats are also known to shift roost locations. As such, where existing evidence already confirms presence of SAR Bats (i.e., Little Brown Myotis, Northern Myotis, Tri-Coloured Bat) it can be assumed that bats will be roosting in certain forest types based on stand composition and tree characteristics (i.e., cavities, crevices, cracks, loose bark, etc. through the PSA, LSA and RSA.			
34	■ Pg. 18 / s.4.3.2 - Bats	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that the study will be designed in such a way to be able to describe the distribution and abundance of bats in relation to the Study Areas. Information collected from stationary acoustic recorders won't be able to provide abundance measures as there is no way of separating individual bats with this method. However, the method can provide presence/absence data, and relative importance of different habitats for bats in different seasons using the proposed bat activity index.	■ Although currently limited due to existing access, actual counts of bats (to inform abundance) in the different habitats encountered along the route is possible using mobile acoustic recordings, as described in A Plan for the North American Bat Monitoring Program (NABat) (Loeb et al., 205). ■ Note: mobile acoustic recordings could also be obtained on the supply road after construction.	■ Stationary acoustic recorders are proposed as a method to provide presence data and to improve our understanding of natural variability in bat relative abundance within and among seasons and years in the PDA and LSA. ■ The possibility of using mobile acoustic recorders may be explored for post-construction monitoring of bat abundance.	■ Wildlife Study Plan: Section 7.2.1.2.2
35	■ Pg. 19 / s.4.3.2.2 – Acoustic Surveys ■ And s.4.3.2.3 – Data Collection	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that acoustic surveys will be designed to account for inter-annual and within-season variability in habitat use by taking place during multiple nights in the late spring, summer and fall seasons to capture bat dispersal and identify breeding and roosting habitats. However, the following section (Data Collection) only indicates that ARUs will be deployed during the roosting period of June 1 to June 30 and peak swarming period of August 1 to August 31. This is not sufficient to appropriately assess all timing and habitat used for migration. Bat acoustic surveys should be extended to September 30.	■ Update the draft Work Plan to describe how all aspects of bat habitat and timing will be assessed.	■ The Study Plan has been refined to indicate that a desktop review will be conducted to identify potential migration corridors.	■ Wildlife Study Plan: Section 7.2.1 and Section 7.2.1.2
36	■ Pg. 21 / s.4.3.4 – Mammals	■ MECP, Species At Risk Branch	■ Table 6-1: Wildlife Indicators (draft Work Plan) and Appendix A – Draft Criteria and Indicators for Alternatives Evaluation (draft Terms of Reference) identify the following example indicators for Wolverine: – Change to Habitat availability (quantity and quality) – Change to Habitat Distribution (i.e., configuration and connectivity) – Change to survival and reproduction ■ As described in both documents, the above indicators are preliminary and will be further refined in the EA, and are provided for the purposes of gathering feedback for the refinement in the EA. As such, it is recommended that additional indicators be considered for Wolverine, including impacts to the species (i.e., spatial and temporal distribution, abundance, den site selection and use, harvest). ■ The draft Work Plan does not adequately address necessary field studies to inform these indicators. Previous and proposed winter aerial surveys and proposed camera trap surveys, which identified the presence of wolverine, are not sufficient to inform the effects of the Project on all stated indicators.	■ Update the draft Work Plan to include additional recommended indicators for Wolverine. ■ Update the draft Work Plan to provide additional detail describing how all relevant indicators for Wolverine will be addressed in the EA. If no additional field studies are proposed, a thorough description of rationale and justification should be provided to MECP and all other relevant regulatory authorities to substantiate this decision.	■ The Study Plan has been updated to more clearly state the objectives of field studies to include determining the seasonal distribution, abundance, population status, movements, and habitat requirements. Interviews for harvest data has been included in a separate section to be more clearly visible. ■ Information about den site selection and use are not included in the Study Plan with the following justification: "Given the low population density of Wolverine in the Study Area, the risk of trapping and radiotracking individuals to obtain den site selection and use information will potentially cause undue harm to the population. This Study Plan assumes that Wolverine are present in the Study Areas and appropriate mitigation measures will be recommended in consultation with the MECP if any den sites are discovered incidentally."	■ Wildlife Study Plan: Section 7.2.3 and 7.2.3.1

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37	■ Pg. 21 / s. 4.3.4.1 – Air Surveys for Mammals	■ MECP, Species At Risk Branch	■ In addition to recording the species, number, location, habitat and time of any observed mammal, evidence of caribou (e.g., tracks, cratering, slushing, etc.) and wolverine (e.g., tracks, etc.) should also be recorded.	■ Update the draft Work Plan accordingly.	■ The requested revision has been made to the updated Study Plan.	■ Wildlife Study Plan: Section 7.2.3.2.2
38	■ Pg. 21 – 22 / s.4.3.4.2 – Wolverine Aerial Surveys	■ MECP, Species At Risk Branch	■ As stated, wolverine live at extremely low densities and the probability of encountering their tracks is low. As such, the proposed transect spacing of approximately 10.6 km apart is insufficient to adequately sample the RSA for wolverine. While MECP recognizes the proposed approach follows the recommended 'Ozhiski Protocol' for caribou (MNRF's Ozhiski Caribou Aerial Survey, 2018: Operating Procedures and Background), reduced transect spacing (i.e., more transects) would increase the sampling area and the likelihood of observing wolverine and/or evidence of wolverine (e.g., tracks). ■ It is recommended that the same hexagon grid referenced in the Ozhiski Protocol be used in the planning of transect layout to ensure consistency with and future range level monitoring for caribou (and wolverine), but that a 2 km spacing is used as per the Select Wildlife and Habitat Features: Inventory Manual (Ranta 1997).	■ Update the draft Work Plan accordingly.	■ Wolverine aerial tracking transect spacing details are provided in the updated Study Plan.	■ Wildlife Study Plan: Section 7.2.3.2.2
39	■ Pg. 21 – 22 / s.4.3.4.2 – Wolverine Aerial Surveys	■ MECP, Species At Risk Branch	■ Additional detail is required on the number of surveyors that will carry out the proposed wolverine aerial surveys. It is recommended that in addition to the pilot, a navigator/lead surveyor and two additional surveyors in the rear of the aircraft (for a total of 4 surveyors) comprise the survey crew.	■ Update the draft Work Plan accordingly.	■ The requested revision has been made to the updated Study Plan.	■ Wildlife Study Plan: Section 7.2.3.2
40	■ Pg. 21 – 22 / s.4.3.4.2 – Wolverine Aerial Surveys	■ MECP, Species At Risk Branch	■ Additional detail is required regarding the survey area. The draft Work Plan indicates that the winter aerial Caribou surveys that will be completed, as per the draft Ungulate Work Plan, will also search for Wolverine. However, the survey area for Caribou is proposed to cover the Caribou LSA (i.e., 35 km buffer of PSA as per draft Ungulate Work Plan) which differs from the Wolverine LSA (i.e., 10 km buffer of PSA).	■ Update the draft Work Plan to provide clarity on the survey area for Wolverine aerial surveys.	■ The study areas are defined in **Section 6** of the Study Plans.	■ Wildlife Study Plan: Section 6 Ungulates Study Plan
41	■ Pg. 22 / s.4.3.4.3 – Motion Sensitive Camera Tracking for Fur Bearers and Small Mammals	■ MECP, Species At Risk Branch	■ Additional detail is required on the intent of the wildlife cameras including a description of how any species at risk information will be used in the impact assessment.	■ Update the draft Work Plan accordingly.	■ The requested revision has been made to the updated Study Plan.	■ Wildlife Study Plan: Section 8.3.4
42	■ Pg. 22 / s.4.3.4.3 – Motion Sensitive Camera Tracking for Fur Bearers and Small Mammals	■ MECP, Species At Risk Branch	■ Additional detail is required on the specific targeted species. If this includes Wolverine, additional detail is required on the number and distribution of trail cameras that will be deployed (see comment #20), the considerations that will inform the placement of cameras, the dates/duration in which they will be deployed, and the information retrieval schedule.	■ Update the draft Work Plan accordingly.	■ The Study Plan has been updated to include additional detail about the specific targeted species, the number and distribution of trail cameras, and considerations for placement of cameras. ■ Additional survey locations and dates will be provided in the upcoming work plan.	■ Wildlife Study Plan: Section 7.2.3.2.4

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43	■ Pg. 22 / s.4.3.4.4 – Wolverine Hair Snag Traps	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that Wolverine hair snag traps will be deployed to determine the potential presence in the PSA and LSA. While presence/absence within the PSA and LSA is relevant information, the Wolverine Hair Snag Traps should also be designed to target collection of demographic information (i.e., determine reproductive female ranges within PSA, LSA and RSA). All aspects of the Wolverine Hair Snag Traps regarding intended purpose, how the information will be analysed and how it will inform the impact assessment need to be clearly identified and described in this section.	■ Update the draft Work Plan accordingly.	■ **Section 7.2.3.5** and **Section 8.3.5** have been updated to include more information.	■ Wildlife Study Plan: Section 7.2.3.2.5 and Section 8.3.5
44	■ Pg. 22 / s.4.3.4.4 – Wolverine Hair Snag Traps	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that two hair snags will be placed at each motion camera deployment location. As per comment #20 and #34, additional detail is required regarding the number of Ground Investigation sites and motion camera locations to clearly indicate how many Wolverine hair snag traps that will be deployed and their distribution.	■ Update the draft Work Plan accordingly.	■ Additional detail has been added about the number and distribution of Wolverine hair snag traps.	■ Wildlife Study Plan: Section 7.2.3.2.5
45	■ Pg. 22 / s.4.3.4.4 – Wolverine Hair Snag Traps	■ MECP, Species At Risk Branch	■ Additional detail is required related to how the camera information collected through hair snag traps will be analysed and be used to inform an assessment of impacts to Wolverine (e.g., unique pelage pattern for unique identification of individuals, sex, reproductive females, etc.)	■ Update the draft Work Plan accordingly.	■ The requested revision has been made to the updated Study Plan.	■ Wildlife Study Plan Section 8.3.4
46	■ Pg. 22 / s.4.3.4.4 – Wolverine Hair Snag Traps	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that local interviews and harvest records from trapping can be used to gain an understanding of the local presence of fur bearers. It is unclear if and/or how this information will be used in the impact assessment. MECP-SARB recommends documenting incidental harvest within the RSA (potentially available through MNRF district offices) and, if possible, conducting local interviews to determine the extent of traditional harvest; as well as a commitment to monitoring harvest rates post-construction to determine the impacts of the road on wolverine populations. ■ The literature suggests the largest source of wolverine mortality is related to harvest (e.g., Krebs et al. 2010, J. Wildl. Manage. 68(3):493-502). The development of a road into an otherwise largely undisturbed landscape increases the risk of harvest as a result of easier access by trappers to these previously inaccessible areas.	■ Update the draft Work Plan to describe how harvest of Wolverine will be incorporated into the baseline studies and considered in the impact assessment.	■ Harvest data will be incorporated into the baseline studies and considered in the impact assessment.	■ Wildlife Study Plan: Section 7.2.3, Section 8.3.1, and Section 9.4.2 ■ Land and Resource Use Study Plan
47	■ Pg. 24 / s.5.1 – GIS	■ MECP, Species At Risk Branch	■ In addition to IAAC, all baseline data available in GIS format should also be provided to the MECP's Species at Risk Branch and MNRF's Natural Heritage Information Centre (NHIC) as complete data sets from all surveys.	■ Update draft Work Plan accordingly.	■ The requested revision has been made to the updated Study Plan.	■ Wildlife Study Plan: Section 8.6 ■ Birds: Section 8.1
48	■ Pg. 24 / s.5.2 – Birds	■ MECP, Species At Risk Branch	■ As it relates to Eastern Whip-poor-will, the identification of each breeding territory should be used to categorize habitat according to the General Habitat Description (GHD).	■ Update draft Work Plan accordingly.	■ The requested revision has been made to the updated Study Plan.	■ Birds Study Plan: Section 7.2.2.7

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49	■ Pg. 25 / s.5.3 – Bats	■ MECP, Species At Risk Branch	■ Similar to comment #25, the survey methods presented are reasonable approaches to identify presence/absence and general bat activity. ■ However, while the identification of 'high potential' or 'high value' habitat can potentially inform appropriate locations to deploy acoustic monitors, assessment of impacts should consider all potential habitat. Bat roosts in forested environments are particularly difficult to identify without more intensive methods (i.e., trapping and attaching transmitters). Bats are also known to shift roost locations. As such, where existing evidence already confirms presence of SAR Bats (i.e., Little Brown Myotis, Northern Myotis, Tri-Coloured Bat) it can be assumed that bats will be roosting in certain forest types based on stand composition and tree characteristics (i.e., cavities, crevices, cracks, loose bark, etc.) through the PSA, LSA and RSA.	■ Update the draft Work Plan to clarify that the acoustic surveys target 'high potential' habitat, as identified through the habitat identification exercise, is intended to inform presence/absence and general bat activity for comparative purposes to inform the location of the road within the LSA and an assessment of impacts; and not to identify high/low quality habitat.	■ The requested revision has been made to the updated Study Plan.	■ Wildlife Study Plan: Section 7.2.1 and Section 8.1
50	■ Pg. 26 / s.5.4.2.1 – Aerial and Track Surveys	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that data acquired from the aerial surveys and remote camera tracking in the PSA will be correlated with specific habitat and environments in the PSA and LSA to determine wildlife activity hotspots. Additional detail is required to describe how baseline information will be used to evaluate impacts to species at risk within the defined RSA's. ■ This comment is also broadly applicable to all proposed monitoring and analyses applicable to species at risk.	■ Update draft Work Plan accordingly.	■ The Study Plan has been updated to include more detail to the data analysis to describe how baseline information will be used to identify wildlife hotspots.	■ Wildlife Study Plan: Section 8.3, Section 8.5, and Section 9 ■ Birds: Section 8 and Section 9
51	■ Pg. 27 / Table 6-1: Wildlife Indicators	■ MECP, Species At Risk Branch	■ Not all species at risk birds (e.g., Eastern Whip-poor-will) are specifically identified under the Breeding Birds indicator along with Olive-sided flycatcher, rusty blackbird and common nighthawk.	■ Update draft Work Plan accordingly.	■ The Study Plan has been revised to include all avian SAR in the table.	■ Birds Study Plan: Table 2-1
52	■ Pg. 27 / Table 6-1: Wildlife Indicators	■ MECP, Species At Risk Branch	■ As per comment #23, recent evidence from Layng et al., 2019 identified Tri-colored Bat within the general vicinity of the Project. As such, the potential for this species to be present within the PSA, LSA and/or RSA cannot be ruled out. The draft Work Plan should clearly indicate how this species at risk will be considered.	■ Update draft Work Plan accordingly.	■ The Study Plan has been updated to include Tri-colored Bat.	■ Wildlife Study Plan: Table 2-1 and Section 7.2.1;
53	■ Pg. 27 / Table 6-1: Wildlife Indicators	■ MECP, Species At Risk Branch	■ Additional factors (i.e., identified as Expressions of Change in the draft Work Plan) should be considered, including changes to predator/prey dynamics. ■ Changes in prey densities (e.g., moose) as a result of changes in landcover (e.g., increased browse) results in increased predator (e.g., wolf) densities. This can often have an impact on caribou and wolverine populations through opportunistic predation.	■ Update draft Work Plan accordingly.	■ The Study Plan has been updated to include changes to predator / prey dynamics as an expression of change. ■ Additional details are provided in the Ungulate Study Plan.	■ Wildlife Study Plan: Table 9-2 ■ Ungulates Study Plan
54	■ Pg. 27 / Table 6-1: Wildlife Indicators	■ MECP, Species At Risk Branch	■ The Indicators identified in the draft Work Plan are listed as Criteria in the draft Terms of Reference and the Expression of Change in the draft Work Plan are listed as Indicators in the draft Terms of Reference. Consistent terminology needs to be used across documents.	■ Update the draft Work Plan accordingly.	■ The requested revision has been made to the updated Study Plan.	■ Birds and Wildlife: Study Plans Section 9.2

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55	■ Pg. 28 / s.6.2 – Methods for Predicting Future Conditions	■ MECP, Species At Risk Branch	■ Ecological processes that will be evaluated for potential susceptibility to adverse effects from the Project should also include hydrological processes associated with fen and bog complexes typical of this land base, specifically how the Project may affect the flow of water through the transitional zone between the Ontario Shield and Hudson Bay/James Bay Lowlands (i.e., ecodistricts 2W-2, 2E-4, 2E-1) resulting in changes to landcover and vegetation associated with species at risk habitat (e.g., caribou, wolverine, etc.).	■ Update the draft Work Plan to indicate that the evaluation of ecological processes will include consideration of Project impacts on hydrological processes that could result in a change to species at risk habitat availability and distribution.	■ The Study Plan has been updated to include the following: "The IA / EA will also consider potential adverse effects from the Project on hydrological processes associated with fen and bog complexes, specifically how the Project may affect the flow of water through the transitional zone between the Ontario Shield and Hudson Bay / James Bay Lowlands and the resulting changes to land cover and vegetation associated with SAR habitat (e.g., Rusty Blackbird, Yellow Rail, Wolverine)."	■ Birds and Wildlife Study Plans: Section 9.4.2 ■ Vegetation Study Plan ■ Surface Water Study Plan
56	■ Pg. 29 / s.6.2.1.2 – Wildlife Habitat Ratings	■ MECP, Species At Risk Branch	■ As per comment #42, additional detail is required to describe how baseline information will be used to evaluate impacts to species at risk within the defined RSA's.	■ Update the draft Work Plan accordingly.	■ The Study Plan has been revised to include potential impacts to SAR based on baseline information.	■ Birds and Wildlife Study Plans: Section 9.4.2
57	■ Pg. 29 / s.6.2.1.2 – Wildlife Habitat Ratings	■ MECP, Species At Risk Branch	■ The referenced HSI models were developed in Western Canada where Wolverine use of the landscape may vary to that in Ontario (i.e., use of elevation resulting in smaller home range sizes). As such, the conditions referenced (i.e., Distance from Linear Feature [0-400m / 400-800m / >800m]) may not be as directly relevant to Ontario wolverine. The Variable and Suitability Index for wolverine presented in Table 6-2 should consider the broader landscape scale and, where available, fine-scale considerations related to den site selection (e.g., avoidance of roads) by Wolverine in Ontario when defining the model variables in the design of HSI models. ■ Wolverine utilize large landscapes with minimal overlap between male home ranges. Evidence specific to Ontario estimated average home range sizes for males and females of 2,563 km2 and 428 km2 respectively (Dawson et al., 2010). These are considerably larger than those cited in the referenced paper associated with North America (Blouin et al., 2004), suggesting Wolverine in Ontario utilize larger landscapes. ■ Additionally, Wolverine are very sensitive to human-caused disturbances, particularly during the denning period. Human contact may cause females to abandon den sites (Myrberget 1968, Copeland 1996; both cited in Copeland and Krucera 1997). Available information suggests that dens are generally located considerable distances from roads, generally supporting large buffers between dens and human activities that range from 2 to 8 km (e.g., Univ. Wyoming 2000, BCMWLAP 2002, Blouin 2006). Current direction in Ontario's Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales (2010) prescribes an AOC with a radius between these extremes (i.e., 4 km). ■ As such, the various modelling variables (i.e., distance to linear features) in the Habitat Suitability Index should also reflect wolverine avoidance of linear features, such as roads, in den site selection to carry out their life processes.	■ Update the draft Work Plan accordingly.	■ The Study Plan has been revised to describe how models will be developed in the IA / EA. The Habitat Suitability Index (HSI) modeling approach is no longer being proposed.	■ Wildlife Study Plan: Section 9.4, Section 3

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58	■ Pg. 29 / s. 6.2.1.3 – Model Confidence and Resolution	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that the HSI models will be based on the evaluation of ELC units and their assumed relationships to a wildlife VC's habitat suitability in the LSA. As per comment #42, additional detail is required to describe how baseline information will be used to evaluate impacts to species at risk within the defined RSA's.	■ Update the draft Work Plan accordingly.	■ The Study Plan has been revised to identify the potential impacts to SAR based on baseline information. The HSI modeling approach is no longer being proposed.	■ Wildlife Study Plan: Section 9.4
59	■ Pg. 30 / s.6.2.2 – Predicted Effects on the Project	■ MECP, Species At Risk Branch	■ Additional effects should be considered as they relate to wolverine, such as increased trapping/harvest of wolverine (e.g., incidental trapping, etc.). ■ The literature suggests the largest source of wolverine mortality is related to harvest (e.g., Krebs et al. 2010, J. Wildl. Manage. 68(3):493-502). The development of a road into an otherwise largely undisturbed landscape increases the risk of harvest as a result of easier access by trappers to these previously inaccessible areas.	■ Update the draft Work Plan to identify increased trapping and/or harvest as one of the predicted effects that will be assessed for wolverine.	■ The Study Plan has been revised to include increased trapping / harvesting (i.e., Wolverine) to predicted effects.	■ Wildlife Study Plan: Section 9.4
60	■ Pg. 30 / s.6.2.2 – Predicted Effects on the Project	■ MECP, Species At Risk Branch	■ Additional effects on habitat use by SAR should be considered, including bat habitat (e.g., roosting, foraging, swarming, hibernacula, etc.), Eastern Whip-poor-will (e.g., nesting, foraging, etc.) and Wolverine (e.g., landscape-scale habitat, fine-scale habitat such as denning).	■ Update the draft Work Plan accordingly.	■ The effects assessment describes how the general life history of SAR as well as their Critical Habitat may be affected by the Project.	■ Wildlife Study Plan: Section 8.5 ■ Birds Study Plan: Section 8
61	■ Pg. 31 / s. 6.3 – Magnitude of Effect	■ MECP, Species At Risk Branch	■ The draft Work Plan indicates that 'severity' is defined as the level of damage to the VC from the effect that can reasonably be expected. It is typically measured as the degree of destruction or degradation within the scope or the degree of reduction of the population within the scope. This definition should include reference to not just degree of destruction or degradation within the scope of the degree of reduction of the population, but also the function of their habitat. ■ The Endangered Species Act, 2007 defines damaging habitat as "an activity that alters the habitat in ways that impair the function (usefulness) of the habitat for supporting one or more of the species' life processes" and destroying habitat as "an activity that alters the habitat in ways that eliminate the function (usefulness) of the habitat for supporting one or more of the species' life processes".	■ Update the draft Work Plan to provide clarity that 'severity' includes both the degree of destruction or degradation within the scope or the degree of reduction of the population and function of habitat.	■ The requested revision has been made to the updated Study Plan.	■ Birds and Wildlife Study Plans: Section 9.6
62	■ Pg. 33 / Table 7-1 - ID#3	MECP, Species At Risk Branch	■ Although Project components other than the route itself are unknown at this time, it is important to recognize that potential impacts from these components of the Project (i.e., aggregate pits, quarries, access roads, etc.) to species at risk will need to be assessed under the Endangered Species Act, 2007 to determine if an ESA authorization is required. As such, additional field studies may be required for species at risk where sufficient information does not already exist.	■ No action required at this time.	■ Comment noted.	■ No Reference
63	■ Pg. 35 / Table 7-1 - ID#24	■ MECP, Species At Risk Branch	■ As per comment #42, all sensitive areas for species at risk need to be identified within the PSA, LSA and RSA, not just the PSA and LSA.	■ Update the draft Work Plan accordingly.	■ Identification of sensitive areas for SAR in the RSA will be conducted through desktop analysis.	■ Wildlife Study Plan: Section 8.5 ■ Birds Study Plan: Section 8

Comment # / Ref #	Draft Study Plan Section	Agency/Regulatory Body Comments Received From	Comment / Context	Action Item	Final Response	Study Plan Section Reference
64	■ Pg. 35 / Table 7-1 - ID#29	■ MECP, Species At Risk Branch	■ As per comment #23, recent evidence from Layng et al., 2019 identified Tri-colored Bat within the general vicinity of the Project. As such, the potential for this species to be present within the PSA, LSA and/or RSA cannot be ruled out. The draft Work Plan should clearly indicate how this species at risk will be considered.	■ Update draft Work Plan accordingly.	■ The Study Plan has been updated to include Tri-colored Bat.	■ Wildlife Study Plan: Table 2-1 and Section 7.2.1;
65	■ Pg. 35 / Table 7-1 - ID#48	■ MECP, Species At Risk Branch	■ As per comment #4, modifications were made to Ontario Ministry of Natural Resources and Forestry's (MNRF) Draft Survey Protocol for Eastern Whip-poor-will in Ontario (2014) through the use of ARU's. However, this is not identified in the draft Work Plan as committed to in Response #48 of Table 7-1.	■ Update the draft Work Plan accordingly.	■ The Study Plan has been updated to indicate that the study design will partially follow the MNRF draft protocol and cited published scientific papers on the use of ARUs to determine the sampling frequency for Eastern Whip-poor-will.	■ Birds Study Plan: Section 7.2.2.5
66	■ Comment on Wildlife, Ungulates and Vegetation work plans	■ MNRF, Nipigon District	■ MNRF staff have reviewed these draft field work plans. We found that they address the field work needs related to our mandates. However MNRF may have items/comments to contribute during the further development of the ToR and the EA.	■ N/A	■ Comment noted.	■ No Reference

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