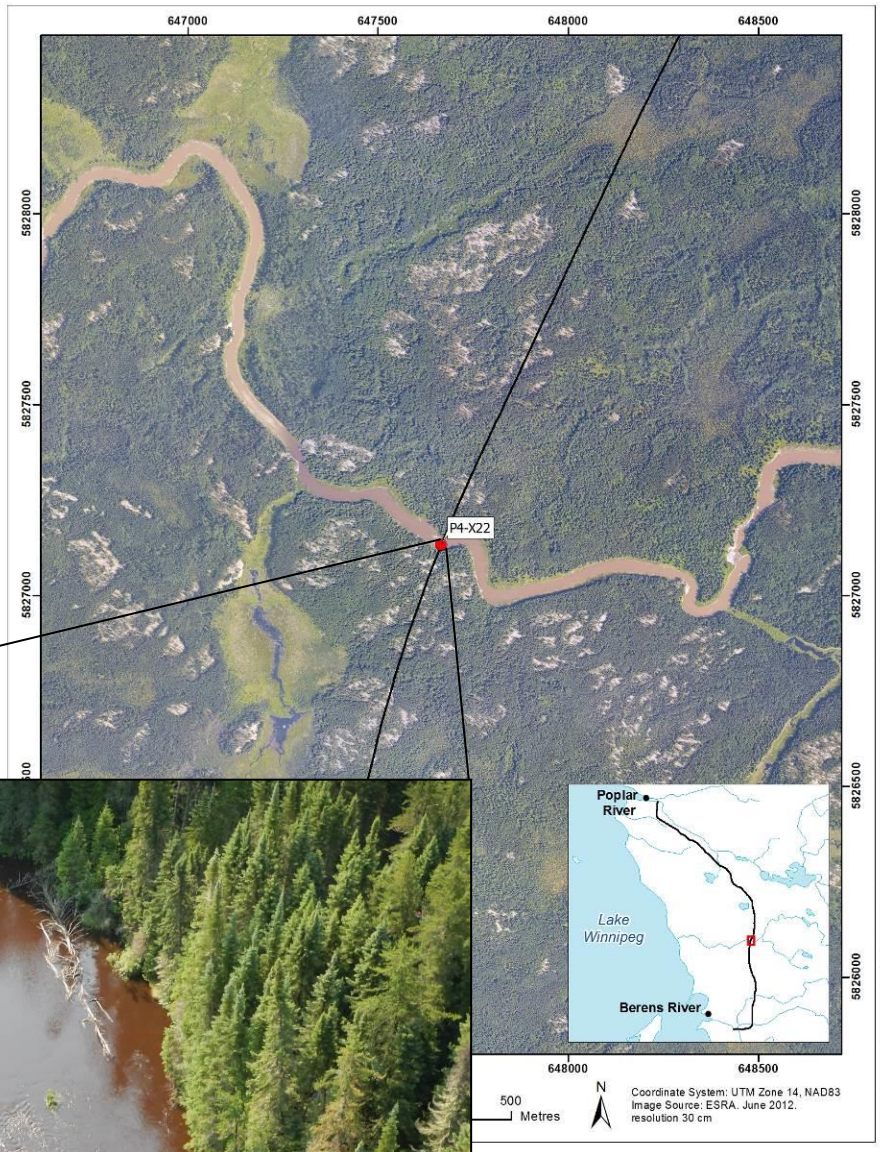
P4-X22 Leaf River

Location

Datum:	NAD 83
UTM:	14U 647669 5827149

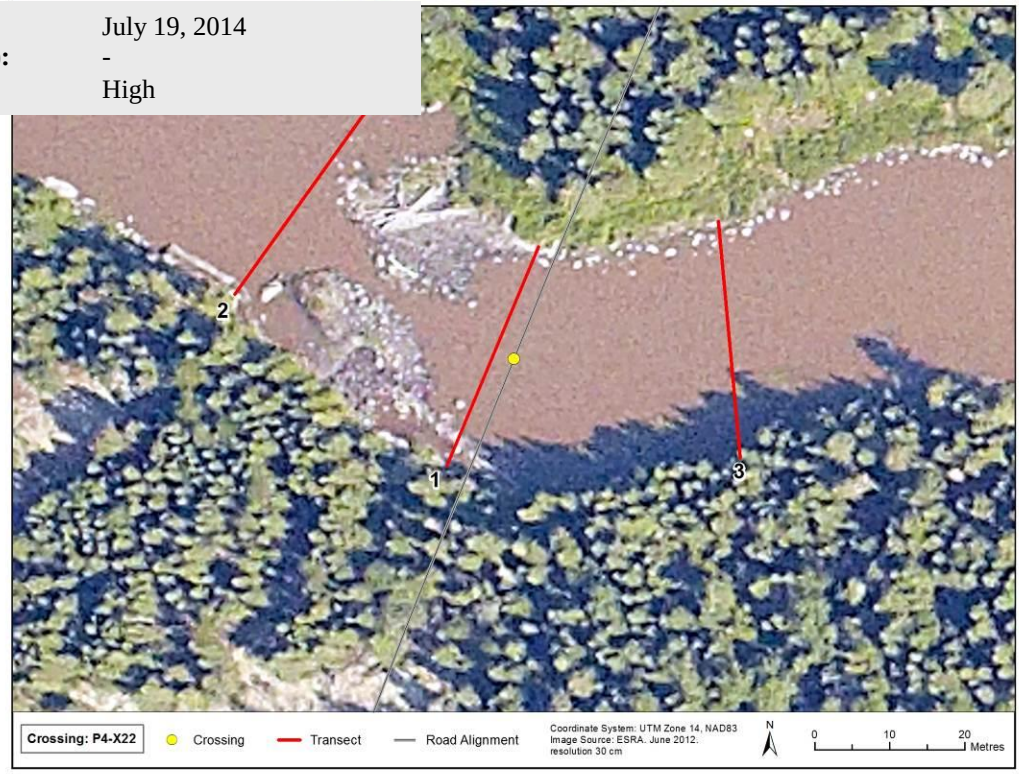
General Morphology

Type:	River
Pattern:	Irreg. Wandering
Channel Profile:	U-shape
Sinuosity:	1.17
Confinement:	Occasion. Confined
Flow Regime:	Perennial



Site Conditions

Survey Date: July 19, 2014
Discharge (m^3/s): -
Stage: High



+ Physical Channel Data

Transect	**1**	**2**	**3**	**4**	**5**
Distance from Crossing[a] (m)	0	40 DS	25 US	-	-
Channel and Flow					
Channel Width (m)	33.8	38.4	32.0	-	-
Wetted Width (m)	33.8	36.5	32.0	-	-
Depth at 25% (m)	-	-	-	-	-
Depth at 50% (m)	-	-	-	-	-
Depth at 75% (m)	-	-	-	-	-
Maximum Depth (m)	-	-	-	-	-
Gradient (%)	-	-	-	-	-
Banks					
Left Bank Height (m)	0.2	flood	0.1	-	-
Right Bank Height (m)	~5	~4	-	-	-
Left Bank Shape	sloping	sloping	sloping	-	-
Right Bank Shape	sloping	vertical	sloping	-	-
Left Bank Materials	organics	organic	organic	-	-
Right Bank Materials	organics	bedrock	organic	-	-
Left Bank Stability	high	high	high	-	-
Right Bank Stability	high	high	high	-	-
Substrate Type and Distribution (%)					
Fines	-	-	-	-	-
Small Gravel	-	-	-	-	-
Large Gravel	-	-	-	-	-
Cobble	-	-	-	-	-
Boulder	-	-	-	-	-
Bedrock	-	-	-	-	-

a – US = upstream from crossing; DS = downstream from crossing.

Site Conditions Continued

+ Riparian Area/Floodplain

Transect	1	2	3	4	5
Floodplain Distance (m)					
Left Bank	7	6.4	6.7	-	-
Right Bank	0	0	0	-	-
Riparian Distance (m)					
Left Bank	7	6.4	6.7	-	-
Right Bank	-	0	0	-	-
Riparian Vegetation Type[a]	GRA/ SHR	GRA/ SHR	GRA	-	-
Canopy Cover (%)	0	0	0	-	-

a – GRA = grass; SHR = Shrub; DEC = deciduous; CON = coniferous; MIX = mixed

+ Habitat Type

Transect	1	2	3	4	5
Flat	-	-	-	-	-
Pool	-	-	-	-	-
Rapid	-	-	-	-	-
Riffle	15	50	-	-	-
Run	85	50	100	-	-
Backwater	-	-	-	-	-

+ Water Quality Data

Sample Date:	July 22, 2014
Habitat:	-
Temperature (°C):	20.1
pH:	5.36
Turbidity (NTU):	30.3
Specific Conductance (µS/cm):	47.5
DO (mg/L):	6.60

Upstream view from the crossing site (Transect 1).

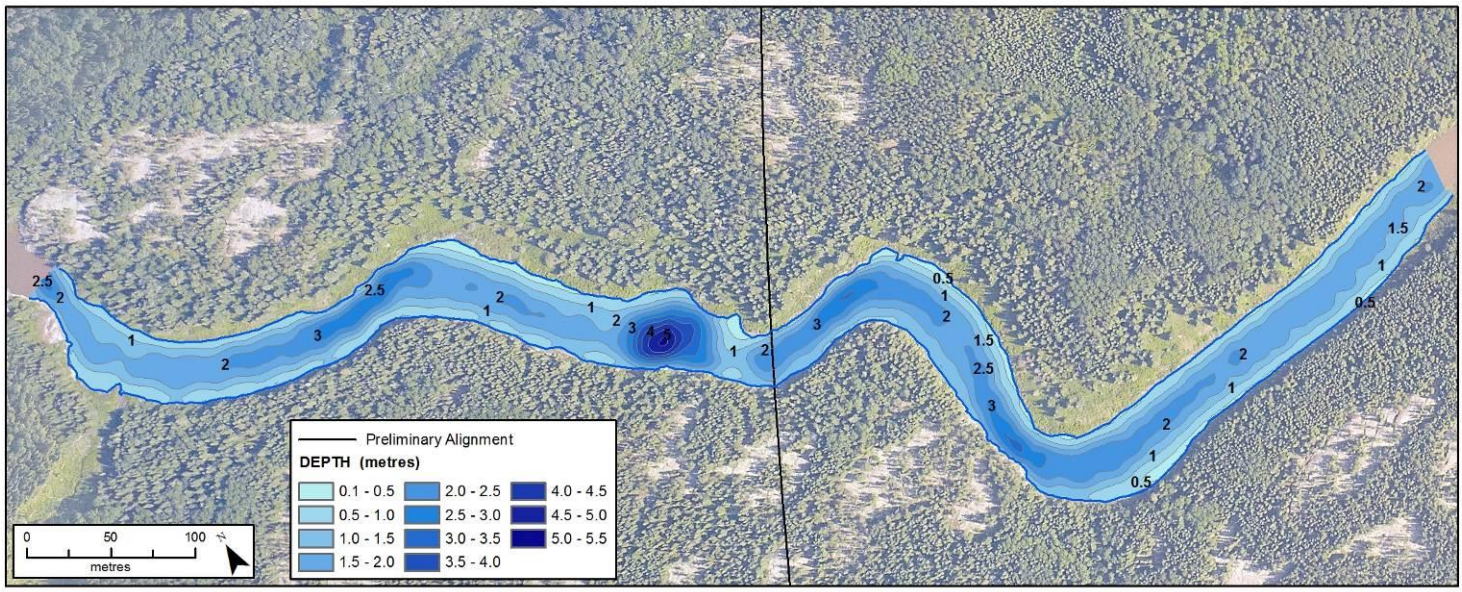
Downstream view from the crossing site (Transect 1).

Cross channel (south) view of crossing site.

Downstream view of the crossing site. Riffle area located immediately downstream from the crossing centerline.

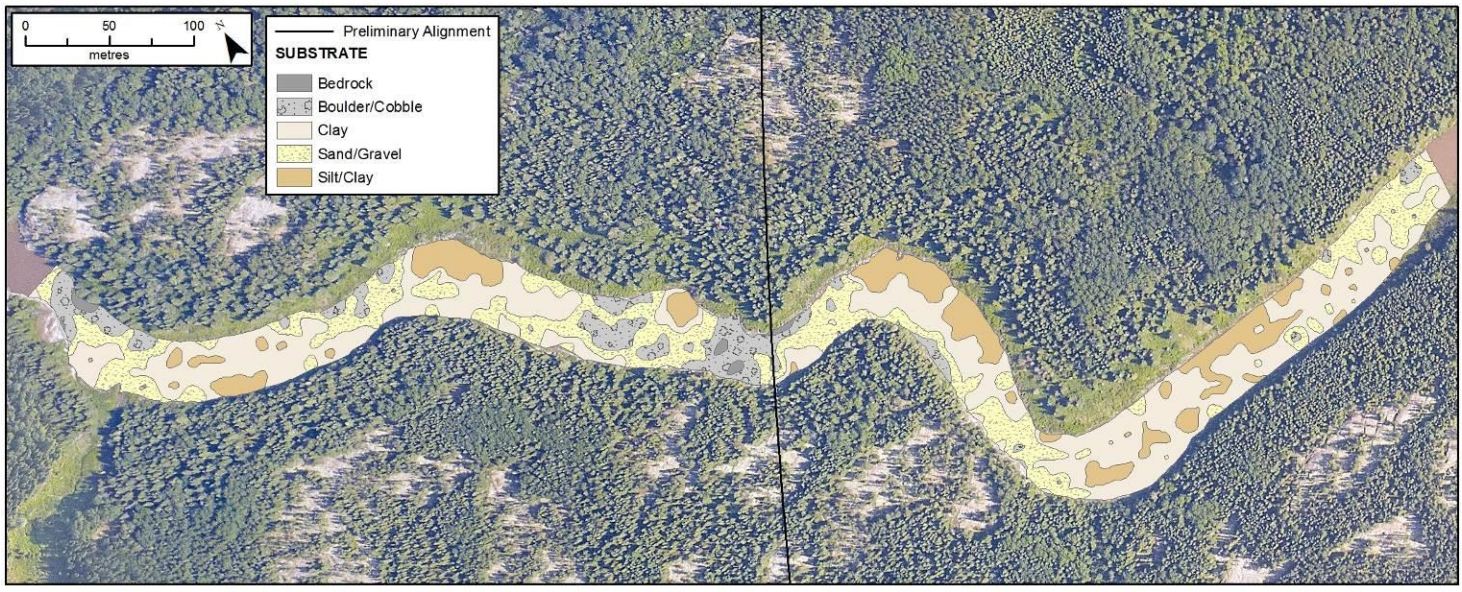
Site Conditions Continued

+ Bathymetric Map



Note: This map is intended for fish habitat assessments. It should not be used for navigation or design purposes.

+ Substrate Map



Note: This is a generalized substrate map, intended for fish habitat assessment. It should not be used for navigation or design purposes.

Site Conditions Continued

+ Cover

	US	DS
Total Cover Available (%)	10	10
Cover Composition (% of Total)		
Large Woody Debris	10	10
Overhanging Vegetation	-	-
Instream Vegetation	90	85
Pool	-	-
Boulder	-	5
Undercut Bank	-	-
Surface Turbulence	-	-
Turbidity	-	-

Fish Presence

+ Fish Habitat Potential

Forage Fish	**US**	**DS**
Spawning	High	High
Rearing	High	High
Overwinter	High	High
Migration	High	High
Large Bodied Fish		
Spawning	High	High
Rearing	Moderate	Moderate
Overwinter	Moderate	High
Migration	High	High

Comments

The Leaf River is fed by Head Leaf Lake and flows east to Lake Winnipeg. It is a medium size perennial watercourse that provides important fish habitat. The crossing site consists of run habitat with sand/gravel and boulder/cobble substrates. A riffle area with boulder/cobble substrates is located immediately downstream of the crossing and is suitable for spawning by suckers and Walleye. Additional spawning areas for these species are found at a series of riffles/rapids 1 km upstream. Macrophyte beds in off current areas may be suitable for spawning by Northern Pike.

+ Fish Sampling Data

Methods: gillnetting

Fish Species Captured: Spottail Shiner, Walleye, White Sucker

Existing Information: None.

Mussel Presence

+ Mussel Sampling Data

Methods: ponar

Mussel Species Captured: None.

Existing Information: None.

Regional Context

+ Habitat

Upstream Drainage Area (km^2): 594
Distance to Major DS Waterbody (km): 28 (Lake Winnipeg)
Connectivity: Yes

Comments
The crossing site provides flat and riffle habitat with cobble/boulder and sand/gravel substrates. This type of habitat is typical of larger rivers in the area and is not considered unique. The habitat is not considered critical or limiting to CRA fishery species.

+ Fishery

Fishery Area: Leaf River, Lake Winnipeg

Fishery Users:

Commercial	Yes - Lake Winnipeg[a]
Recreational	Yes
Aboriginal	Yes – Poplar River First Nation[b]

Comments
The Leaf River supports recreational and Aboriginal fisheries, including Walleye and suckers. Lake Winnipeg also supports a variety of commercial species. The crossing area contributes to these fisheries by providing potential feeding, spawning and overwintering habitat; however the habitat not considered critical to CRA species populations.

Information Sources:

a – Manitoba Conservation (2014)
b – ESRA 2009

Crossing Information

+ Proposed Crossing

Type	Two-span bridge[a]
Diameter (mm)	-
Length (m)	TBD
Number of Barrels	-
Provision of Fish Passage	Yes

Information Sources:

a – pers. comm. ESRA

Risk Assessment

+ Preliminary Considerations

Attribute	Rating	Comments
Supports a CRA Fishery	Yes	The watercourse is known to support a variety of CRA fishery species. The immediate crossing area is expected to support a range of life requisites including spawning, rearing, and feeding for species such as suckers and Walleye.
Species at Risk Present	No	No known species at risk.

+ Impacts to Fish and Fish Habitat

Type	Multi-span bridge construction and operation
Minor Impact List	No
Residual Impact	Channel infilling from a single instream pier Habitat alteration from rip rap placement at base of the pier

Attribute	Rating	Comment
Extent of Impact	Low	Infilling and rip rap placement will be limited to the footprint and immediate base of the pier.
Duration of Impact	High	The infill and rip rap will be in place for approximately 50 years.
Availability & Condition	Low	The affected habitat is common within moderately sized river systems in the region. The east side Lake Winnipeg area is largely undeveloped and the habitat within the river remains intact.
Impact on Relevant Fish	Low	The habitat at the crossing site provides suitable spawning and/or rearing habitat for CRA fishery species (i.e. Walleye, sucker, Northern Pike). This type of habitat is not considered to be critical or limiting as similar habitat is plentiful in the region, as are the affected species. Fish are expected to fulfill their life requisites using similar habitats located outside of the footprint of the pier. Negative impacts to fish populations from rip rap placement are unlikely as it provides a similar substrate to current conditions. Habitat impacts are expected to result in no measureable effect to local fish populations.

+ Risk of Serious Harm to Fish

Risk Rating: LOW

Qualification: Based on the small area of impact, abundance of similar habitat within the system, and absence of critical or limiting habitat, bridge construction is expected to have minimal impact on the productivity of local fish populations.

Net Habitat Change

Habitat Change				
Type of Structure: Two-span Bridge				
Effect	**Pathway of Effect**	**Proposed Area Affected**	**Existing Area Affected**	**Loss/Gain**
Instream Alteration	None[1]	161 m^2	0 m^2	161 m^2
Instream Destruction	Footprint[2]	5.84 m^2	0 m^2	-5.84 m^2

1 – Bridge design was unavailable at the time of assessment. Area calculated as the area rip rap armouring around a single pier and was estimated based on AECOM design drawings provided in Plans PR 304 to Berens River All Season Road Alignment Tender No. B5 Pigeon River Bridge, issued October 3, 2013.

2 – Bridge design was unavailable at the time of assessment. Habitat loss is estimated using the area of two piers from the Pigeon River bridge design (based on AECOM design drawings provided in Plans PR 304 to Berens River All Season Road Alignment Tender No. B5 Pigeon River Bridge, issued October 03, 2013).

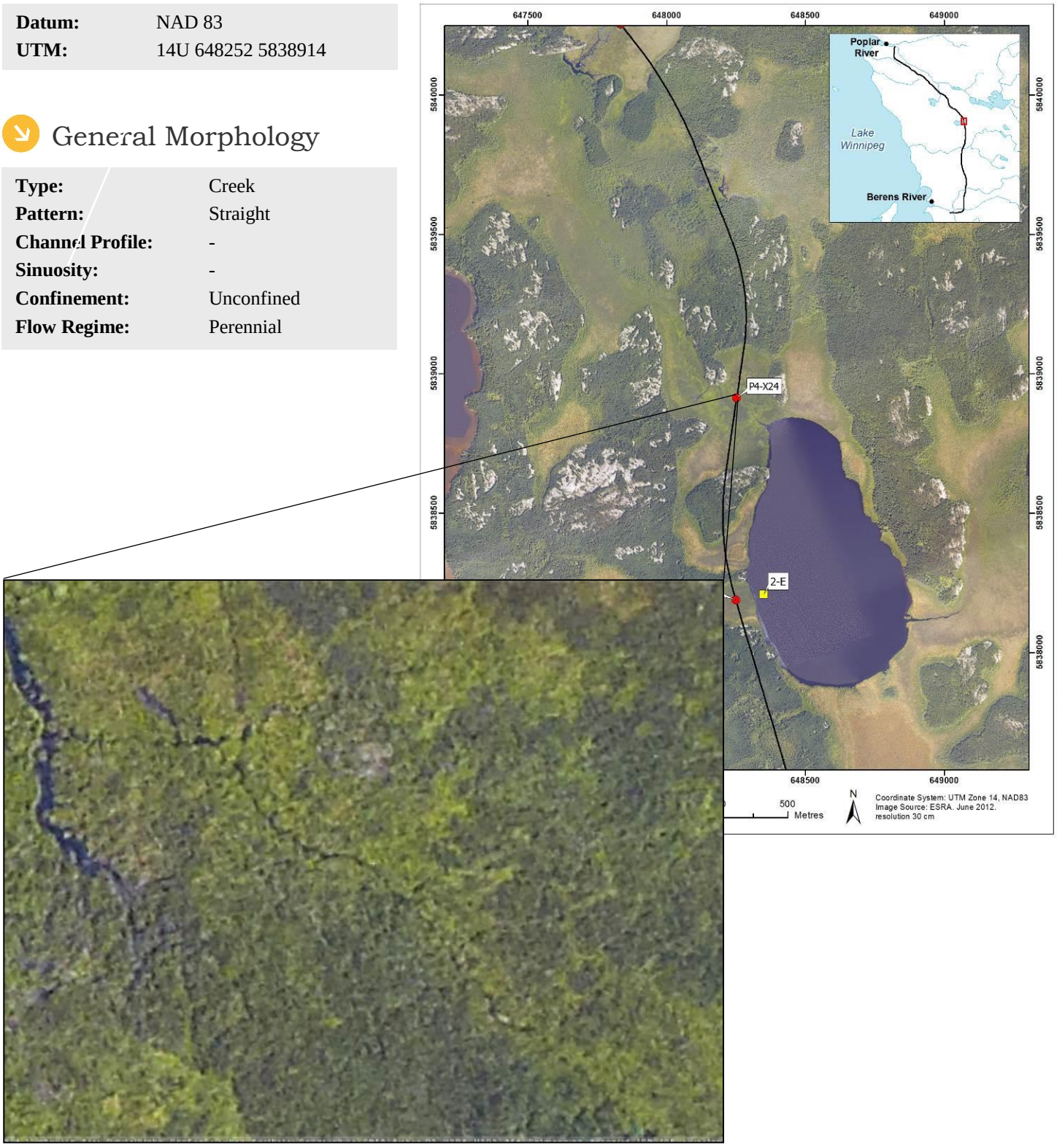
P4-X24 Unnamed Pamatakakowin Lake Tributary

Location

Datum:	NAD 83
UTM:	14U 648252 5838914

General Morphology

Type:	Creek
Pattern:	Straight
Channel Profile:	-
Sinuosity:	-
Confinement:	Unconfined
Flow Regime:	Perennial



Site Conditions

Survey Date:	July 21, 2014
Discharge (m^3/s):	-
Stage:	Flood

+ Physical Channel Data

Transect	**1**	**2**	**3**	**4**	**5**
Distance from Crossing[a] (m)	0	-	-	-	-
Channel and Flow					
Channel Width (m)	~0.5	-	-	-	-
Wetted Width (m)	-	-	-	-	-
Depth at 25% (m)	-	-	-	-	-
Depth at 50% (m)	-	-	-	-	-
Depth at 75% (m)	-	-	-	-	-
Maximum Depth (m)	-	-	-	-	-
Gradient (%)	-	-	-	-	-
Banks					
Left Bank Height (m)	flood	-	-	-	-
Right Bank Height (m)	flood	-	-	-	-
Left Bank Shape	-	-	-	-	-
Right Bank Shape	-	-	-	-	-
Left Bank Materials	organic	-	-	-	-
Right Bank Materials	organic	-	-	-	-
Left Bank Stability	high	-	-	-	-
Right Bank Stability	high	-	-	-	-
Substrate Type and Distribution (%)					
Fines	100	-	-	-	-
Small Gravel	-	-	-	-	-
Large Gravel	-	-	-	-	-
Cobble	-	-	-	-	-
Boulder	-	-	-	-	-
Bedrock	-	-	-	-	-

a – US = upstream from crossing; DS = downstream from crossing

Site Conditions Continued

+ Riparian Area/Floodplain

Transect	1	2	3	4	5
Floodplain Distance (m)					
Left Bank	-	-	-	-	-
Right Bank	-	-	-	-	-
Riparian Distance (m)					
Left Bank	-	-	-	-	-
Right Bank	-	-	-	-	-
Riparian Vegetation Type[a]	GRA	GRA	GRA	GRA	GRA
Canopy Cover (%)	0	0	0	0	0

a – GRA = grass; SHR = Shrub; DEC = deciduous; CON = coniferous; MIX = mixed

+ Habitat Type

Transect	1	2	3	4	5
Flat	100	-	-	-	-
Pool	-	-	-	-	-
Rapid	-	-	-	-	-
Riffle	-	-	-	-	-
Run	-	-	-	-	-
Impoundment	-	-	-	-	-

+ Water Quality Data

Sample Date:	-
Habitat:	-
Temperature (°C):	-
pH:	-
Turbidity (NTU):	-
Specific Conductance (µS/cm):	-
DO (mg/L):	-

Upstream view from crossing site.

Downstream view from crossing site.

Aerial view of connection to downstream Pamatakakowin Lake.

Upstream view from approximately 25 m upstream from crossing.

Site Conditions Continued

+ Cover

	US	DS
Total Cover Available (%)	20	20
Cover Composition (% of Total)		
Large Woody Debris	-	-
Overhanging Vegetation	-	-
Instream Vegetation	100	100
Pool	-	-
Boulder	-	-
Undercut Bank	-	-
Surface Turbulence	-	-
Turbidity	-	-

Fish Presence

+ Fish Habitat Potential

Forage Fish	**US**	**DS**
Spawning	High	High
Rearing	High	High
Overwinter	None	None
Migration	None	None
Large Bodied Fish		
Spawning	None	Low
Rearing	None	Low
Overwinter	None	None
Migration	None	None

Comments

The crossing site lies on a wetland stream with downstream connectivity to Pamatakakowin Lake. Pamatakakowin Lake is a small, poorly connected lake, with no defined channel connection to other lakes in the region. Fish presence and availability of overwintering habitat within the lake is unknown; however based on size and connectivity, it is unlikely to support large-bodied fish.

Habitat at the crossing site consists of a narrow channel (<0.5 m) with fine substrates. Low flow habitat with instream vegetation for cover provides suitable spawning, rearing, and feeding habitat for forage fish species. Fish use would be seasonal due to insufficient depths for overwintering.

+ Fish Sampling Data

Methods: not sampled.

Fish Species Captured: none

Existing Information: none

Mussel Presence

+ Mussel Sampling Data

Methods: Not sampled; unsuitable habitat.

Mussel Species Captured: -

Existing Information: -

Regional Context

+ Habitat

Upstream Drainage Area (km^2): 5.2
Distance to Major DS Waterbody (km): 0.15 (Pamatakakowin Lake)
Connectivity: Yes

Comments
The crossing is located on a small wetland stream and provides low flow habitat with fine substrates and instream vegetation for cover. This type of habitat is abundant within the region.

+ Fishery

Fishery Area: Pamatakakowin Lake

Fishery Users:

Commercial	None
Recreational	Unknown
Aboriginal	Unknown

Comments
The unnamed tributary has downstream connectivity to Pamakakowin Lake. The presence of a recreational or Aboriginal fishery in this lake is unknown; however based on poor connectivity and size, it is unlikely that the lake supports large-bodied fish. Even if a fishery is present, the importance of the habitat would be considered low; habitat at the culvert site is considered marginal habitat for forage fish and does not provide direct habitat for CRA species.

Information Sources:

a – Manitoba Conservation (2014)

Crossing Information

+ Proposed Crossing

Type	Culvert[a]
Diameter (mm)	TBD
Length (m)	TBD
Number of Barrels	TBD
Provision of Fish Passage	Yes

Information Sources:

a – pers. comm. ESRA.

Risk Assessment

+ Preliminary Considerations

Attribute	Rating	Comments
Supports a CRA Fishery	No	Habitat use by species that are part of or support a CRA fishery is not expected.
Supports Species at Risk	No	No known species at risk.

+ Impacts to Fish and Fish Habitat

Type	Culvert construction and operation
Minor Impact List	No
Residual Impact	Channel infilling within footprint of the culvert. Habitat alteration from rip rap placement at culvert inlet and outlet

Attribute	Rating	Comment
Extent of Impact	Low	The infill of the stream bed and rip rap placement is restricted to the culvert site.
Duration of Impact	High	The infill and rip rap will be in place for approximately 50 years.
Availability & Condition	Low	The affected habitat is common and widespread within boreal streams in the region. The east side Lake Winnipeg area is relatively undeveloped and small stream habitats remain largely intact.
Impact on Relevant Fish	Low	The habitat within the crossing footprint is marginal and expected to support only forage fish species. The downstream lake, small and poorly connected to a larger waterbody is not expected to support species of fish that are part of or support a CRA fishery. Habitat impacts are expected to result in no measureable effect to potential downstream fisheries.

+ Risk of Serious Harm to Fish

Risk Rating: LOW

Qualification: Based on the small area of impact, marginal habitat and absence of direct habitat for CRA fishery species, culvert construction and operation is expected to have no measureable impact on the productivity of local fish populations.

Net Habitat Change

Type of Structure: Culvert				
Effect	**Pathway of Effect**	**Proposed Area Affected**	**Existing Area Affected**	**Loss/Gain**
Instream Alteration	None[1]	0 m^2	0 m^2	0 m^2
Instream Destruction	Footprint[2]	15 m^2	0 m^2	-15 m^2

1 – Any habitat alterations due to rip rap included in footprint (i.e., destruction)
2 – Culvert design unavailable at the time of assessment. Area estimated based on the length of culvert crossings constructed as part of the Provincial Road 304 to Berens River All Season Road Project (30 m) and the channel width at the crossing (0.5 m).