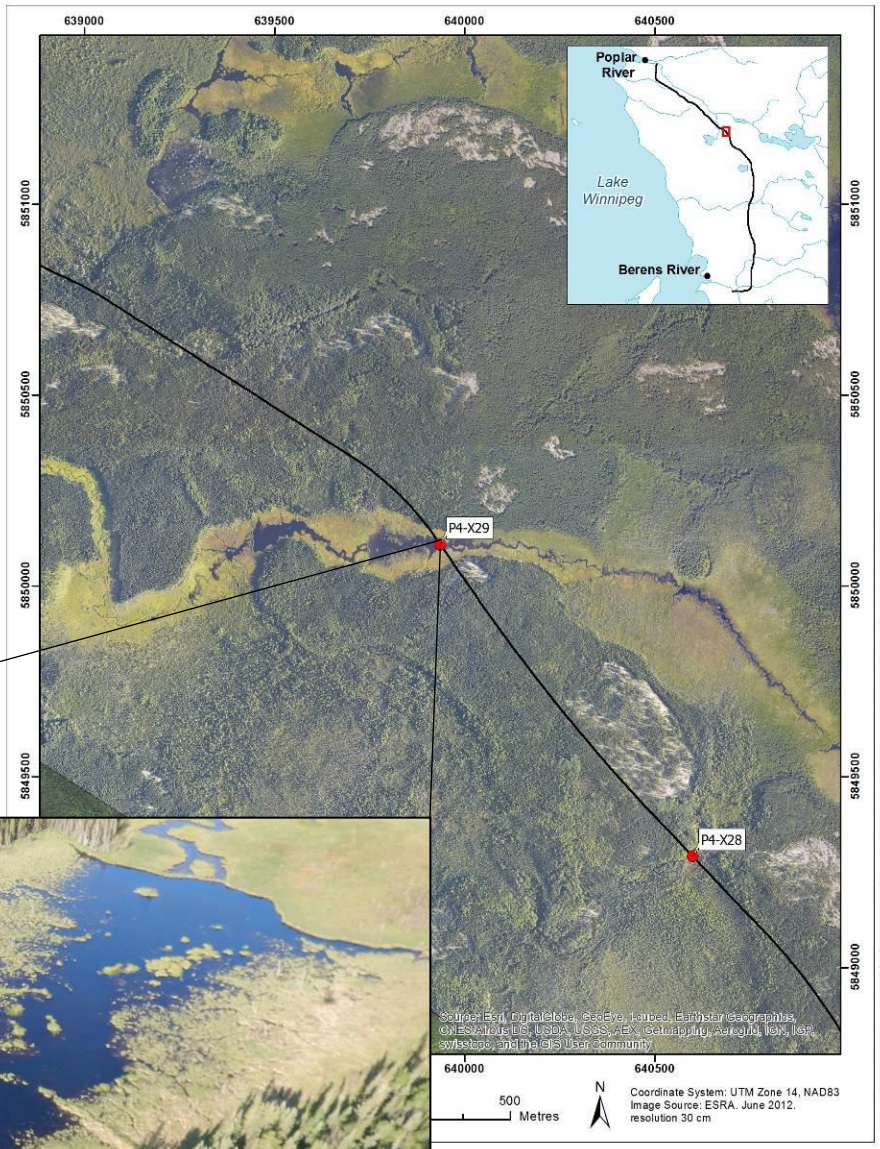
P4-X29 Unnamed Okeyakkoteinewin Creek Tributary

Location

Datum:	NAD 83
UTM:	14U 639943 5850093

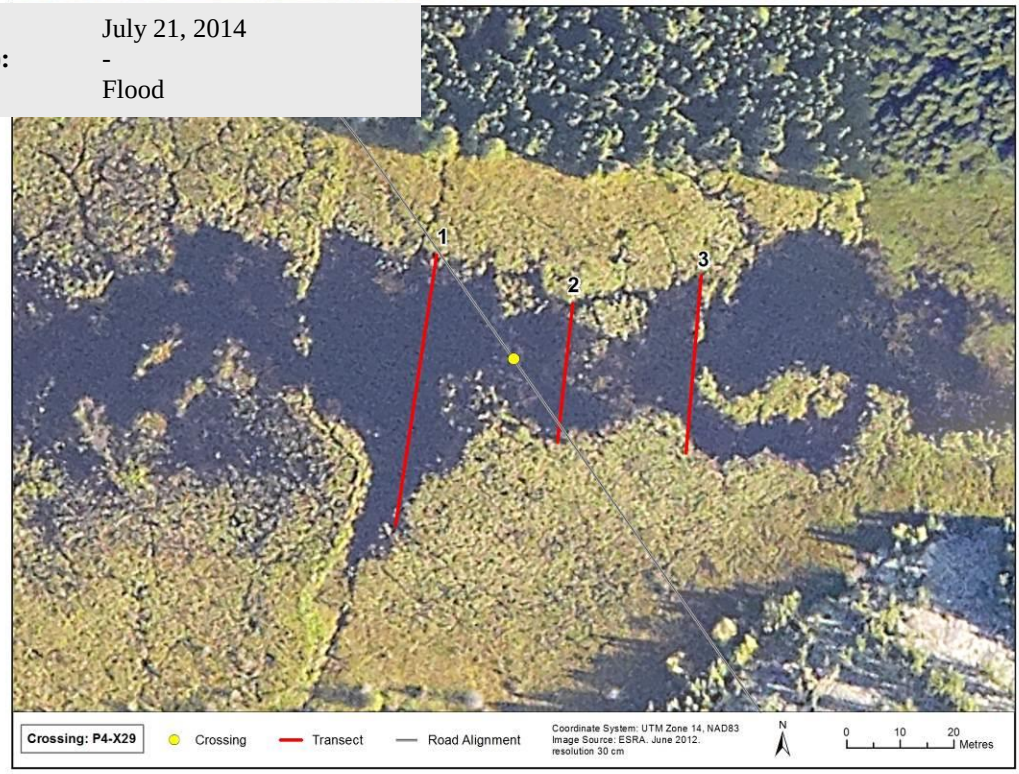
General Morphology

Type:	Creek
Pattern:	-
Channel Profile:	Notched
Sinuosity:	1.14
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)	30 DS	0	30 US	-	-
Channel and Flow					
Open Channel Width (m)	40.2	26.5	31.1	-	-
Wetted Width (m)	-	-	-	-	-
Depth at 25% (m)	-	-	-	-	-
Depth at 50% (m)	-	-	-	-	-
Depth at 75% (m)	-	-	-	-	-
Maximum Depth (m)	>1	>1	>1	-	-
Gradient (%)	-	-	-	-	-
Banks					
Left Bank Height (m)	flooded	flooded	flooded	-	-
Right Bank Height (m)	flooded	flooded	flooded	-	-
Left Bank Shape	-	-	-	-	-
Right Bank Shape	-	-	-	-	-
Left Bank Materials	organic	organic	organic	-	-
Right Bank Materials	organic	organic	organic	-	-
Left Bank Stability	high	high	high	-	-
Right Bank Stability	high	high	high	-	-
Substrate Type and Distribution (%)					
Fines	100	100	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	28.3	24.7	21.9	-	-
Right Bank	53.9	54.9	35.7	-	-
Riparian Distance (m)					
Left Bank	28.3	24.7	21.9	-	-
Right Bank	53.9	54.9	35.7	-	-
Riparian Vegetation Type[a]					
	GRA	GRA	GRA	-	-
Canopy Cover (%)					
	0	0	0	0	-

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

+ Habitat Type

Transect	1	2	3	4	5
Flat	-	-	-	-	-
Pool	100	100	100	-	-
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.

Upstream view from crossing site.

Beaver dam located approximately 190 m downstream from crossing site.

Downstream from the crossing, the channel is heavily impacted by beaver dams.

Site Conditions Continued

+ Cover

	US	DS
Total Cover Available (%)	25	25
Cover Composition (% of Total)		
Large Woody Debris	-	-
Overhanging Vegetation	-	-
Instream Vegetation	50	50
Pool	50	50
Boulder	-	-
Undercut Bank	-	-
Surface Turbulence	-	-
Turbidity	-	-

Fish Presence

+ Fish Habitat Potential

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

Comments
The crossing is located on a fen stream that has been heavily impacted by beaver activity. At least six beaver dams were identified downstream from the crossing. The crossing site provides pool habitat with soft substrates and moderate levels of instream vegetation for cover. Habitat is relatively uniform throughout the entire surveyed reach. Although the stream provides suitable for spawning and rearing habitat for Northern Pike, numerous downstream dams likely preclude fish passage to the crossing site. Fish use is expected to be limited to spawning and rearing by forage fish species. Overwintering habitat for forage fish is present within the beaver impoundments; however these habitats may become anoxic during winter, limiting overwintering use to species tolerant of low dissolved oxygen levels.

+ Fish Sampling Data

Methods: electrofishing

Fish Species Captured: Brook Stickleback

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):	3.29
Distance to Major DS Waterbody (km):	10.1 (Poplar River)
Connectivity:	Yes - Unlikely

Comments

The crossing is located on a fen stream. The habitat is flat with fine substrates and is heavily impacted by beaver dams. This type of fen habitat is abundant within the region.

+ Fishery

Fishery Area: Poplar River, Lake Winnipeg

Fishery Users:

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

Comments

The unnamed watercourse is a tributary of the Okeyakkoteinewin Creek and has downstream connectivity to Poplar River and Lake Winnipeg. The importance of the habitat to these fisheries is considered low; habitat at the culvert site is considered marginal habitat for forage fish and is not expected to 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	The habitat does not directly support CRA fish species or key prey species of CRA fish species.
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 fen stream habitats remain largely intact.
Impact on Relevant Fish	Low	Although suitable spawning and rearing habitat for Northern Pike is present at the crossing site, numerous ephemeral barriers to fish passage downstream of the crossing preclude migrations of CRA fishery species from Poplar River. Habitat impacts are expected to result in no measureable effect to downstream fisheries.

+ Risk of Serious Harm to Fish

Risk Rating: LOW

Qualification: Based on the small area of impact and the absence of direct access to the habitat within the project footprint by 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]	795 m^2	0 m^2	-795 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 (26.5 m).

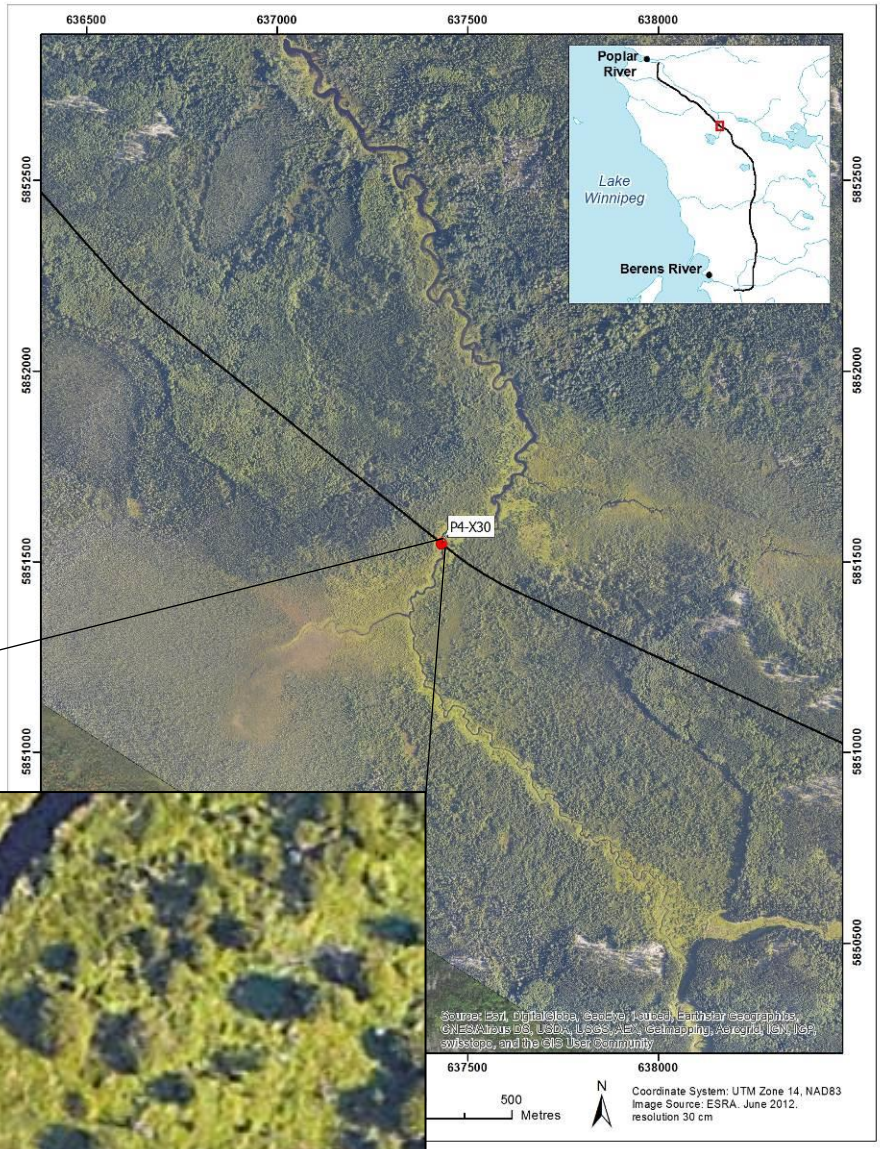
P4-X30 Okeyakkoteinewin Creek

Location

Datum:	NAD 83
UTM:	14U 637435 5851547

General Morphology

Type:	Creek
Pattern:	Irregular Meandering
Channel Profile:	U-shaped
Sinuosity:	1.40
Confinement:	Unconfined
Flow Regime:	Perennial



Site Conditions

Survey Date: July 21, 2014
Discharge (m^3/s): 0.46
Stage: Moderate

+ Physical Channel Data

Transect	**1**	**2**	**3**	**4**	**5**
Distance from Crossing[a] (m)	0	30 US	75 US	25 DS	75 DS
Channel and Flow					
Channel Width (m)	6.3	6.4	6.9	7.8	7.7
Wetted Width (m)	6.3	6.4	4.8	4.6	5.4
Depth at 25% (m)	0.93	1.1	0.98	0.71	0.55
Depth at 50% (m)	-	-	1.2	1.0	0.81
Depth at 75% (m)	1.2	-	0.9	0.73	0.8
Maximum Depth (m)	>1.2	>1.1	1.2	1.1	0.92
Gradient (%)	-	-	-	-	-
Banks					
Left Bank Height (m)	0.47	0.36	0.40	0.60	0.57
Right Bank Height (m)	0.38	-	0.30	0.50	0.50
Left Bank Shape	vert	vert	slope	slope	slope
Right Bank Shape	vert	slope	slope	vert	vert
Left Bank Materials	organic	organic	organic	organic	organic
Right Bank Materials	organic	organic	organic	organic	organic
Left Bank Stability	high	high	high	high	high
Right Bank Stability	high	high	high	high	high
Substrate Type and Distribution (%)					
Fines	100	100	100	100	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]	SHR/ GRA	SHR/ GRA	SHR/ GRA	SHR/ GRA	SHR/ 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	100	100	100	100
Pool	-	-	-	-	-
Rapid	-	-	-	-	-
Riffle	-	-	-	-	-
Run	-	-	-	-	-
Impoundment	-	-	-	-	-

+ Water Quality Data

Sample Date:	July 22, 2014
Habitat:	Flat
Temperature (°C):	16.8
pH:	5.72
Turbidity (NTU):	28.4
Specific Conductance (µS/cm):	62.1
DO (mg/L):	6.77

Upstream view from crossing site.

Downstream view from crossing site.

Downstream view at Transect 5 (75 m downstream from crossing).

Downstream view at 170 m downstream.

Site Conditions Continued

+ Cover

	US	DS
Total Cover Available (%)	5	5
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	Low	Low
Migration	Low	Low
Large Bodied Fish		
Spawning	High	High
Rearing	Moderate	Moderate
Overwinter	None	None
Migration	Moderate	Moderate

Comments
Okeyakkoteinewin Creek is a moderate size stream with downstream connectivity to Poplar River. The crossing site provides flat habitat dominated by fine substrate. Instream vegetation provides cover for fish and provides suitable spawning and rearing habitat for Northern Pike. The habitat is expected to support spawning, rearing and feeding by forage fish species. Forage fish, tolerant of low dissolved oxygen, may overwinter in deeper areas.

+ Fish Sampling Data

Methods: electrofishing

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):	65.3
Distance to Major DS Waterbody (km):	6.4 (Poplar River)
Connectivity:	Yes

Comments

The crossing is located on a fen stream. The habitat is flat with fine substrates and is heavily impacted by beaver dams. This type of fen habitat is abundant within the region.

+ Fishery

Fishery Area: Poplar River, Lake Winnipeg

Fishery Users:

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

Comments

Okeyakkoteinewin Creek and has downstream connectivity to Lake Winnipeg via the Poplar River. The crossing site contributes to downstream fisheries by providing seasonal habitat (spawning, rearing) for a CRA species (Northern Pike) that would move into the creek from the Poplar River during spring.

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	Yes	The habitat is suitable for spawning and rearing by Northern Pike.
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 at the crossing site is suitable for spawning, rearing and feeding of Northern Pike and is not considered critical or limiting to CRA fishery species. Both Northern Pike and the affected habitat are common in the region. Habitat impacts are expected to result in no measureable effect to downstream fisheries as suitable habitat for relevant fish is located outside of the project right-of-way.

+ Risk of Serious Harm to Fish

Risk Rating: LOW

Qualification: Based on the small area of impact and abundance of similar habitat within the system, 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]	189 m^2	0 m^2	-189 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 (6.3 m).

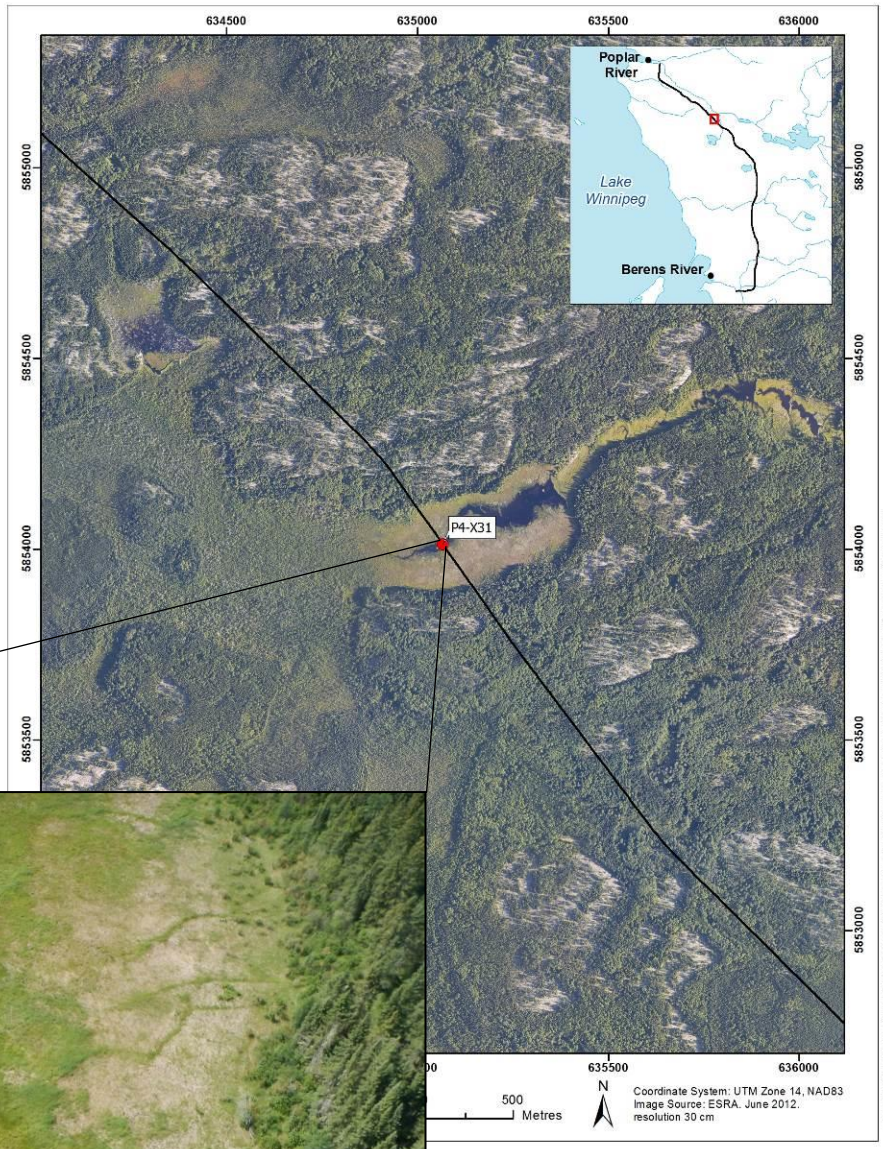
P4-X31 Unnamed Okeyakkoteinewin Creek Tributary

Location

Datum:	NAD 83
UTM:	14U 635069 5854014

General Morphology

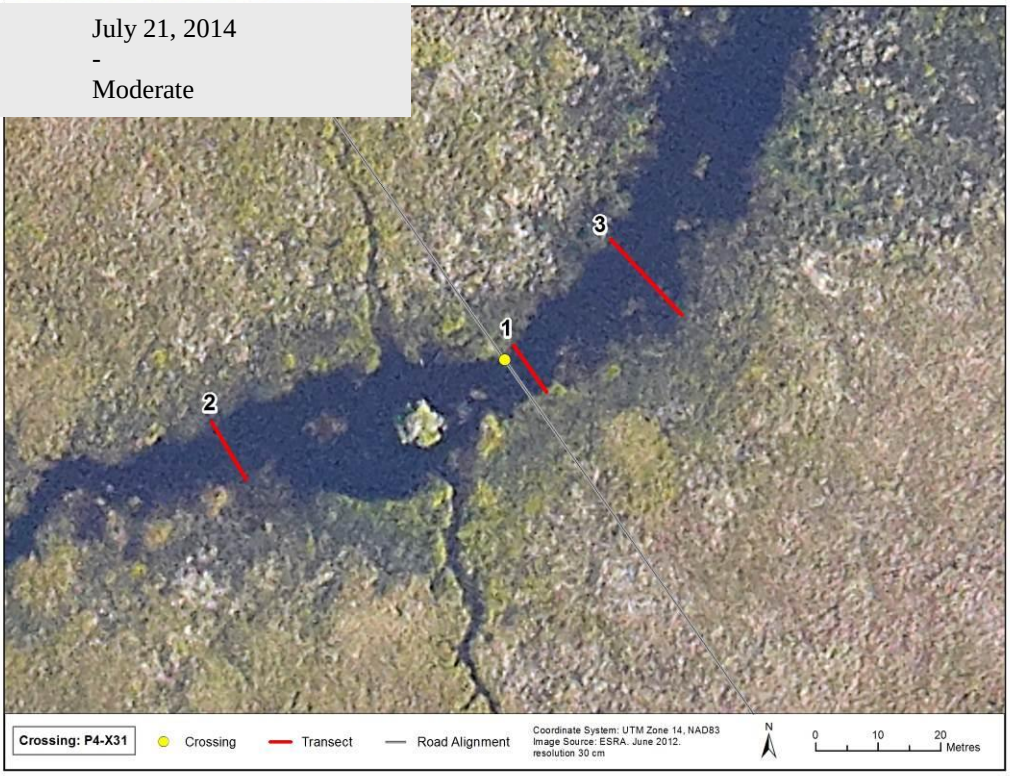
Type:	Creek
Pattern:	Irregular Meandering
Channel Profile:	U-shaped
Sinuosity:	-
Confinement:	Unconfined
Flow Regime:	Perennial



North/South Consultants Inc.
Aquatic Environment Specialists

Site Conditions

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



+ Physical Channel Data

Transect	**1**	**2**	**3**	**4**	**5**
Distance from Crossing[a] (m)	0	40 US	25 DS	-	-
Channel and Flow					
Channel Width (m)	8.8	6.2	7.8	-	-
Wetted Width (m)	1.4	1.85	2.8	-	-
Depth at 25% (m)	0.30	0.46	0.24	-	-
Depth at 50% (m)	0.24	0.33	0.49	-	-
Depth at 75% (m)	0.19	0.30	0.32	-	-
Maximum Depth (m)	0.30	0.46	0.49	-	-
Gradient (%)	-	-	-	-	-
Banks					
Left Bank Height (m)	0.20	0.10	0.14	-	-
Right Bank Height (m)	0.13	0.09	0.11	-	-
Left Bank Shape	slope	slope	slope	-	-
Right Bank Shape	slope	slope	slope	-	-
Left Bank Materials	organic	organic	organic	-	-
Right Bank Materials	organic	organic	organic	-	-
Left Bank Stability	high	high	high	-	-
Right Bank Stability	high	high	high	-	-
Substrate Type and Distribution (%)					
Fines	100	100	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	133	124	141	-	-
Right Bank	109	76	108	-	-
Riparian Distance (m)					
Left Bank	133	124	141	-	-
Right Bank	109	76	108	-	-
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	100	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.

Beaver dam and impoundment located 325 m downstream from crossing.

Small, narrow channel immediately downstream from dam.

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	Low	Low
Migration	Low	Low
Large Bodied Fish		
Spawning	Low	Low
Rearing	Low	Low
Overwinter	None	None
Migration	None	None

Comments
The unnamed creek is a small, first order stream with downstream connectivity to Okeyakkoteinewin Creek. The creek is heavily impacted by beaver dams; several dams were identified downstream from the crossing and may restrict fish passage to the crossing site. The stream crossing site is moderately wide (8.8 m) and provides flat habitat dominated by fine substrate. The channel narrows (<1 m) immediately downstream of a beaver dam, approximately 325 m downstream. Based on poor connectivity (numerous downstream dams) and relatively small channel in areas downstream from the crossing, the crossing site is considered marginal fish habitat. The habitat is suitable for spawning, rearing and feeding by forage fish species. Large bodied fish use is not expected.

+ Fish Sampling Data

Methods: electrofishing

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):	8.9
Distance to Major DS Waterbody (km):	6.4 (Poplar River)
Connectivity:	Yes - unlikely

Comments

The crossing is located on a small tributary stream. The habitat is flat with fine substrates and is heavily impacted by beaver dams. This type of habitat is abundant within the region. No sensitive or critical habitats were identified.

+ Fishery

Fishery Area: Poplar River, Lake Winnipeg

Fishery Users:

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

Comments

The unnamed creek is connected to Okeyakkoteinewin Creek and has downstream connectivity to Lake Winnipeg via the Poplar River. The importance of the habitat to these fisheries is 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	The habitat does not directly support CRA fish species or key prey species of CRA fish species.
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 at the crossing site is considered marginal and expected to support only forage fish species. Numerous ephemeral barriers to fish passage downstream of the crossing preclude migrations of CRA fishery species from the Poplar River or Lake Winnipeg. Habitat impacts are expected to result in no measureable effect to downstream fisheries.

+ 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 direct habitat for CRA fishery species within the project footprint, 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]	264 m^2	0 m^2	-264 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 (8.8 m).

APPENDIX 7. NET HABITAT CHANGE RESULTING FROM THE BERENS RIVER FIRST NATION TO POPLAR RIVER FIRST NATION ALL SEASON ROAD PROJECT.

Site	Watercourse	Instream Destruction (m^2)	Instream Alteration (m^2)[1]	Riparian Destruction (m)[2]	Riparian Alteration (m)[3]
P4-X01	Berens River	5.84	161.5	36	48
P4-X04	Etomami River	11.68	323	36	48
P4-X07	North Etomami River	5.84	161.5	36	48
P4-X22	Leaf River	5.84	161.5	36	48
P4-X30	Okeyakkoteinewin Creek	189	0	36	0[4]
	Total	**218.68**	**807.5**	**180**	**192**

1 – instream alteration consist of the addition of rip rap below the high water mark. Rip rap is expected to increase the diversity and productivity of the stream and is therefore not considered an adverse effect.
2 – calculated as the width of the road bed on each bank.
3 – calculated based on a 60 m cleared right-of-way on each bank. Does not include the length of riparian destruction.
4 – Existing riparian consists of low growing vegetation. Alteration due to clearing for line of sight safety requirements is not expected.