Preliminary Design of the Highway 11 2+1 Roadway Model Pilot Project: GWP 5151-21-00

Fish and Fish Habitat Existing Conditions Report

Ontario Ministry of Transportation

60713279

May 2025

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AECOM: 2024-12-21

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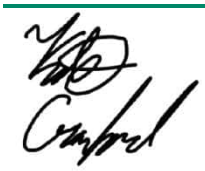

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1. Introduction

The Ontario Ministry of Transportation (MTO) has retained AECOM Canada ULC. (AECOM) to undertake the Preliminary Design and Group B Class Environmental Assessment (Class EA) Study for a 2+1 Roadway Model Pilot Project on Highway 11, between the City of North Bay and the Town of Temagami. A 2+1 highway is a three-lane highway that typically involves a passing lane that changes directions approximately every 2 to 5 kilometres (km). The Study is split into two assignments:

- GWP 5151-21-00: Highway 11 from Sand Dam Road northerly to Ellesmere Road (13.8 km); and,
- GWP 5033-22-00: Highway 11 from 4.6 km north of Highway 64 northerly 11.4 km to 340 m south of Jumping Caribou Road.

Included in this assignment is the comprehensive assessment of the fish and fish habitat in or near the limits of GWP 5151-21-00 that will potentially be impacted by reconstruction of Highway 11 for the implementation of the 2+1 roadway model. GWP 5151-21-00 is located in the geographic townships of Merrick, Blyth, Notman, and Lyman, in the District of Nipissing, and within the Electoral Riding of Temiskaming-Cochrane. It will stretch from Sand Dam Road north to Ellsmere Road (13.8 km) (the 'Project'). The results in this report include the fisheries assessment, including background information review, field investigations, and preliminary general assessment of the potential impacts of the Project to fish and fish habitat. The comprehensive fisheries assessment was conducted in accordance with the *Interim Environmental Guide for Fisheries* (the Guide) (MTO 2020a) and the *Pilot MTO/DFO/NDMNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings, Version 4* (the Protocol) (2020b). This includes a step-by-step process to identify regulatory review and/or notification requirements. Some of these steps include:

- Gathering of existing fish and fish habitat data and supplementing through field investigations;
- Determination of the presence of aquatic Species at Risk (SAR); and,
- Preliminary identification of the potential for the Project to cause the death of fish or harmful alteration, disruption or destruction (HADD) of fish habitat, in contravention of the *Fisheries Act, 1985.*

The existing conditions for GWP 5033-22-00 will be presented under a separate cover titled Preliminary Design of the Highway 11 2+1 Roadway Model Pilot Project: GWP 5033-22-00 Fish and Fish Habitat Existing Conditions Report (AECOM, 2025).

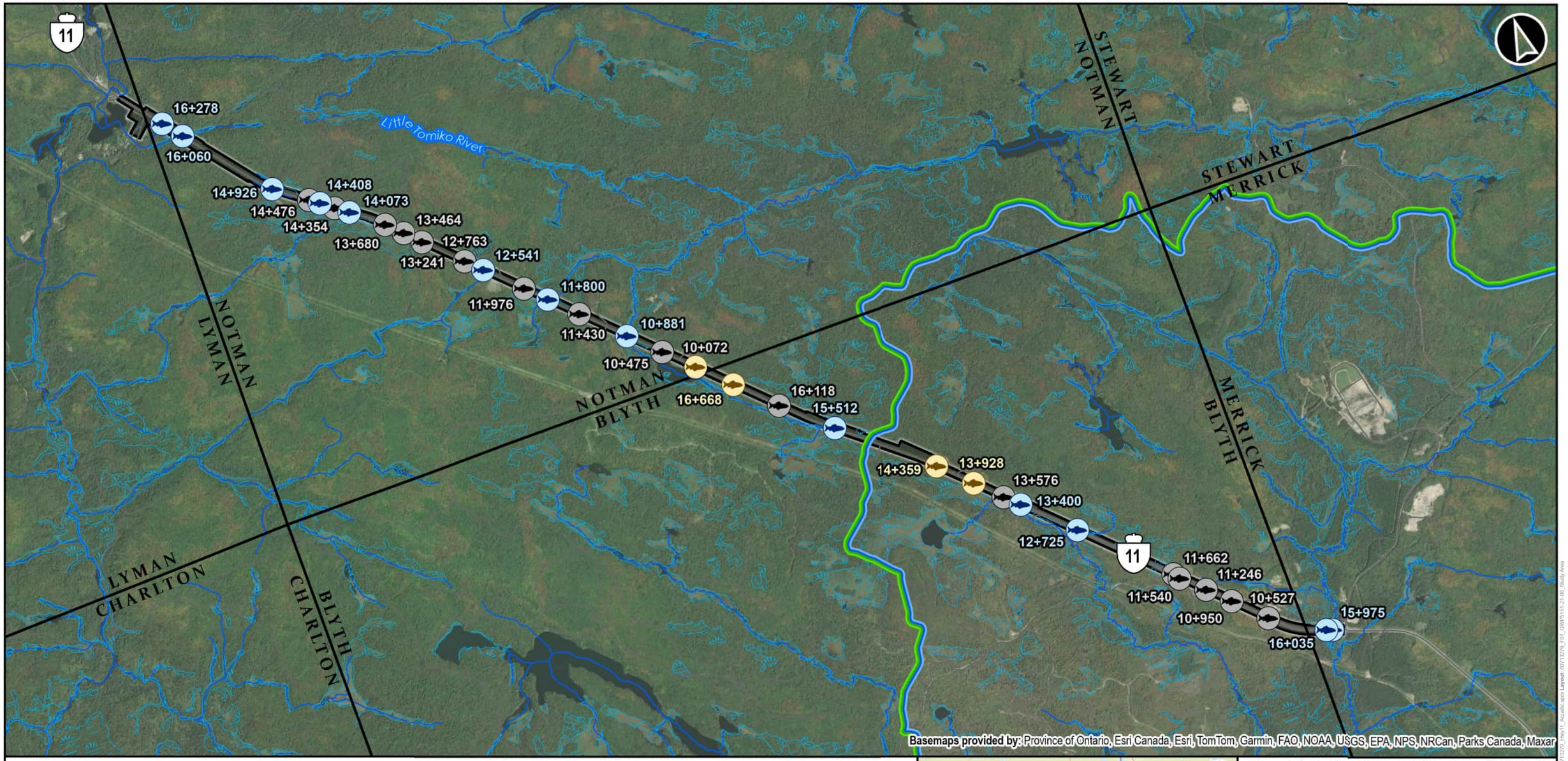
1.1 Project Location

The Project limits extend along Highway 11 between the City of North Bay and the Town of Temagami, from Sand Dam Road northerly 13.8 km to Ellesmere Road (GWP 5151-21-00).

For the purposes of the fisheries assessment, the Study Area includes water features detected through background information review and the 2024 field investigations within 120 meters (m) of the Project limits of GWP 5151-21-00. Waterbodies were assessed where they intersected with Highway 11. The locations of fisheries site survey are listed below in **Table 1** and shown in **Figure 1**. Each study location is identified using the station number and township.

Table 1: Location of Fisheries Studies for GWP 5151-21-00 (Template D1)

Chainage	Waterbody ID	Highway	Township	Latitude	Longitude
15+975	Little Sturgeon River	Highway 11	Merrick	46.4944	-79.5044
16+035	Little Sturgeon River	Highway 11	Merrick	46.4943	-79.5052
10+527	Unnamed Drainage Feature	Highway 11	Blyth	46.4976	-79.5123
10+950	Unnamed Drainage Feature	Highway 11	Blyth	46.5002	-79.5161
11+246	Unnamed Drainage Feature	Highway 11	Blyth	46.501989	-79.518911
11+540	Unnamed Drainage Feature	Highway 11	Blyth	46.5038	-79.5218
11+662	Unnamed Drainage Feature	Highway 11	Blyth	46.5047	-79.5227
12+725	Unnamed Tributary to Little Sturgeon River	Highway 11	Blyth	46.5115	-79.5323
13+400	Unnamed Tributary to Little Sturgeon River	Highway 11	Blyth	46.5156	-79.5385
13+576	Unnamed Drainage Feature	Highway 11	Blyth	46.5166	-79.5402
13+928	Unnamed Drainage Feature	Highway 11	Blyth	46.5188	-79.5439
14+359	Unnamed Drainage Feature	Highway 11	Blyth	46.5217	-79.5477
15+512	Unnamed Tributary to Tomiko River	Highway 11	Blyth	46.5283	-79.5596
16+118	Unnamed Drainage Feature	Highway 11	Blyth	46.532	-79.5649
16+668	Unnamed Drainage Feature	Highway 11	Blyth	46.5355	-79.5701
10+072	Unnamed Tributary to Little Tomiko River	Highway 11	Notman	46.538	79.5742
10+475	Unnamed Drainage Feature	Highway 11	Notman	46.5407	-79.5777
10+881	Unnamed Tributary to Little Tomiko River	Highway 11	Notman	46.5431	-79.5817
11+430	Unnamed Drainage Feature	Highway 11	Notman	46.5468	-79.5865
11+800	Unnamed Tributary to Little Tomiko River	Highway 11	Notman	46.5491	-79.5899
11+976	Unnamed Drainage Feature	Highway 11	Notman	46.5503	-79.5918
12+541	Unnamed Tributary to Little Tomiko River	Highway 11	Notman	46.5536	-79.5971
12+763	Unnamed Drainage Feature	Highway 11	Notman	46.5551	-79.599
13+241	Unnamed Drainage Feature	Highway 11	Notman	46.5585	-79.6041
13+464	Unnamed Drainage Feature	Highway 11	Notman	46.5597	-79.6056
13+680	Unnamed Drainage Feature	Highway 11	Notman	46.5612	-79.608
14+073	Unnamed Tributary to Tomiko River	Highway 11	Notman	46.563	-79.6116
14+354	Unnamed Drainage Feature	Highway 11	Notman	46.5632	-79.6114
14+408	Unnamed Tributary to Tomiko River	Highway 11	Notman	46.5632	-79.6114
14+926	Unnamed Tributary to Tomiko River	Highway 11	Notman	46.5675	-79.6205
16+060	Unnamed Tributary to Elbow Lake (Tomiko River)	Highway 11	Notman	46.5753	-79.6291
16+278	Unnamed Tributary to Elbow Lake (Tomiko River)	Highway 11	Notman	46.5772	-79.6314



LEGEND

- Township
- Preliminary Project Area

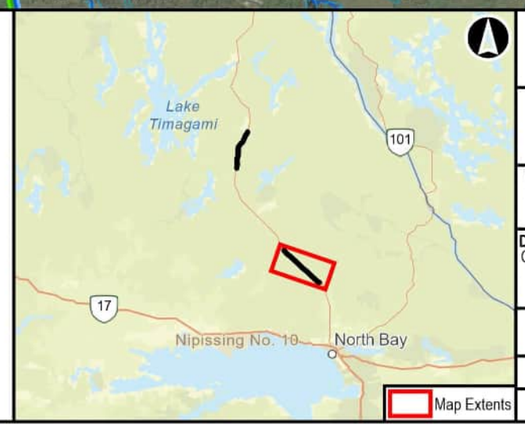
FishHabitat

- Direct
- Indirect
- Not Fish Habitat

- Watercourse
- Unevaluated Wetland

Watershed Name

- Little Sturgeon River
- Tomiko River



Fish and Fish Habitat Existing Conditions Report - Preliminary Design and Class Environmental Assessment (EA) Study for Highway 11 2+1 GWP 5121-21-00

Location of Fisheries Studies for GWP-5151-21-00

0 0.25 0.5 1 1.5 2 2.5 3 km

NAD 1983 CSRS MTM 10

Data Sources:
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AECOM	Ontario
Mar, 2025	1:40,000
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Figure: 1

2. Background Data Collection

A review of available background information was completed using several online sources, topographic maps, aerial imagery, and other sources of natural heritage information provided by the Ontario Ministry of Natural Resources (MNR). These resources were reviewed to obtain available existing fishery data such as species composition, records of aquatic SAR, fish sanctuaries, migration barriers, watershed and drainage systems, and associated wetlands. These resources included:

- MNR Make-a-Map: Natural Heritage Information Centre (MNR, 2024a);
- MNR Ontario Land Information Ontario (LIO) base mapping data (MNR, 2024b);
  - Aquatic resource area point segment
  - Aquatic resource area line segment
  - Aquatic resource area polygon segment
  - Watershed mapping
- Fisheries and Oceans Canada (DFO) (SAR) On-line mapping (DFO, 2024);
- SAR in Ontario Species Range Maps (Ontario Ministry of the Environment, Conservation and Parks [MECP], 2024);
- MNR Fish OnLine (MNR, 2024c); and
- MNR Forest Management Plan (Ontario Ministry of Natural Resources and Forestry [MNRF], 2019).

The Notice of Study Commencement and request for available fisheries data associated with the Study Area was submitted to the Northeast Regional Operations Division of the MNR in October 2023 in accordance with the Protocol. A response was received from Lynn Moreau (Regional Planner) on November 30, 2023. A copy of agency correspondence can be found in **Appendix B**.

2.1 Background Data Collection Results

The Study Area consists of GWP 5151-21-00 from Sand Dam Road northerly to Ellesmere Road. The watercourses within the Study Area spanned the Little Sturgeon River watershed and the Tomiko River watershed. In-water work timing windows are typically determined by the MNR and are based on the spawning and early development periods of fish that occur in a watercourse. Limited fish community data was available for the watercourses in the Study Area through the background information review, including through correspondence with MNR. As such, MNR have not provided in-water work timing windows for construction and have indicated that timing windows are to be informed by the results of this assessment.

2.1.1 Little Sturgeon River Watershed

The Little Sturgeon River watershed covers approximately 19,734 hectares of land and is located approximately 12 km north of the City of North Bay (MNR, 2024b). The Study Area spans the watershed for approximately 6.5 km north from Sand Dam Road. The tributaries from this watershed flow into Little Sturgeon River, which ultimately discharges into Lake Nipissing. The portion of the Study Area that spans the headwaters in the upper reaches of the Little Sturgeon River watershed crosses six mapped watercourses, with additional inputs, drainage features, wetland, and tributaries visible in satellite imagery and mapping crossing and adjacent to Highway 11. Fishery and waterbody information for watercourses in the Study Area was limited. Some tributaries to the Little Sturgeon River, including the Little Sturgeon River at 15+975/16+035, and 15+630 in Merrick Township are designated as coldwater thermal regime with records of Brook Trout (*Salvelinus fontinalis*) (MNR 2024b).

2.1.2 Tomiko River Watershed

The Tomiko River watershed covers approximately 55,027 hectares of land and is located approximately 25 km north of the City of North Bay along Highway 11 (MNR, 2024b). The Study Area spans approximately 7.5 km of this watershed. The tributaries flow into Tomiko Lake, discharge into Tomiko River, and then flow approximately 7 km before converging with the Sturgeon River. Tomiko Lake is the confluence point for many lakes and tributaries within the Tomiko River watershed, with the most upstream locations including Little Tomiko Lake, Poplar Lake, and North Spruce Lake. Mapped watercourses as well as additional inputs, drainage features, wetlands, and tributaries visible in satellite imagery and mapping cross and flow adjacent to Highway 11. Fishery and waterbody information for watercourses in the Study Area is limited. Thermal regimes for several watercourses within and adjacent to the Study Area are designated as warmwater, including the tributaries to the Little Tomiko River at 10+881 and 11+800 in Notman Township. However, further downstream, the Little Tomiko River is designated as coldwater thermal regime with records of Brook Trout. Coolwater thermal regime game fish (i.e., frequently targeted by recreational anglers) including Northern Pike (*Esox lucius*), Smallmouth Bass (*Micropterus dolomieu*), and Walleye (*Sander vitreus*) are present in Jarvis Lake, Tomiko River, and Elbow Lake, all outside of but near the Study Area.

2.1.3 Aquatic Species at Risk

Under the Ontario *Endangered Species Act,* 2007 (ESA) and the federal *Species at Risk Act,* 2002 (SARA), only species listed as Threatened (THR) and Endangered (END) receive individual and habitat protection. For the purposes of this report, these species will be considered SAR. Aquatic Special Concern (SC) species are not subject to prohibitions under the ESA or SARA, but the species and their habitat are considered through the recommendations in applicable Management Plans drafted under the ESA or SARA and the general provisions of the *Fisheries Act,* 1985. It is important to note that any SC species potentially present within the Study Area may be uplisted to THR or END during the lifetime of the Project. Should this occur, consultation with relevant federal and provincial government agencies may be required to determine how to proceed and avoid contravention of the ESA and/or SARA.

No aquatic SAR are known to inhabit the watercourses identified in the Study Area based on the background information review. This includes the Little Sturgeon River and its tributaries in the Study Area.

3. Field investigations

3.1 Field Investigation Methods

Results obtained from the field investigations were used to characterize the fish habitat, identify any sensitive or significant aquatic features that may be impacted by the proposed work, and to inform Project design of fisheries-related constraints and considerations applicable to the Project. The aquatic component of the fisheries assessment was completed following methodologies outlined in the Guide and in conjunction with the Protocol. Fisheries survey and detailed assessment of fish habitat were completed where waterbodies intersected with Highway 11, as shown in **Table 1** and **Figure 1**, to describe the fish habitat in detail at those specific locations, and to identify and characterise the fish habitat at all waterbodies in the Study Area. Field investigations were completed by a team of two AECOM ecologists, and when possible were accompanied by a member of Temagami First Nation The fish habitat in the Study Area assessed and described in detail herein is therefore not an exhaustive extent of all fish habitat in the Study Area.

Two separate assessments (spring and summer) were completed in order to capture potential seasonal changes in habitat conditions. During the spring field investigations from April 29 to May 15, 2024, sites identified as possible watercourses were initially inspected to determine the potential to support fish. Habitat features, barriers to fish passage and access, flow regime, and connectivity to direct fish habitat are typically taken into consideration when making this determination. According to the Guide, detailed and general assessments were completed for waterbodies within the Study Area where potential fish habitat was identified and where accessible on public or MTO land. This included: documentation, photographs and site sketches of channel characteristics (i.e., morphology, mean channel dimensions, water quality parameters), general fish habitat features (i.e., substrate and aquatic vegetation composition, in-stream and riparian cover, function of habitat for fish), areas of sensitivity such as areas of erosion potential, suitable habitat to support important fish life processes (i.e., spawning, migration, nursery habitat), suitable habitat to support aquatic SAR (i.e., spawning, migration, general use, nursery, etc.), and any other notable observations relating to the aquatic environment.

As per the Guide, the Study Area at each watercourse crossing was divided into two zones to assess fish habitat and ultimately inform the potential impacts from the proposed works on fish habitat. The Zone of Detailed Assessment (ZDA) typically includes the area within the MTO right-of-way (ROW), from 0 m to 50 m downstream of the ROW, and from 0 m to 20 m upstream of the ROW. The Zone of General Assessment (ZGA) covers from 50 m to 200 m downstream of the ROW and from 20 m to 50 m upstream of the ROW (of which only a general description of the aquatic environment is reviewed).

A second assessment of fish habitat in the Study Area was completed again during the summer field investigations between August 6 and August 23, 2024. During the summer field investigation, fish habitat that was assessed in the spring were assessed again to confirm habitat conditions and update as needed pending seasonal changes.

Fish sampling was also completed during the summer of 2024 at select locations where potential fish habitat was identified. Fish sampling was carried out using one or a combination of: dip net, angling, seine net, minnow traps baited with dry cat food, and backpack electrofishing. Site conditions at the time of assessment dictated the method(s) that were employed, such as water depth, visibility, conductivity, substrate type, safe access, etc. The fish collections were carried out under the authority of a License to Collect Fish for Scientific Purposes from the MNR.

A photographic record was collected during the field surveys and is provided in **Appendix C**. Raw field notes recorded during the fish habitat assessments are provided in **Appendix D**.

3.2 Fish and Fish Habitat Existing Conditions

Those features that intersect with the current alignment of Highway 11 and determined to be direct fish habitat are described below. **Table 2** summarizes the existing fish habitat conditions documented through field investigations. Those determined through field investigations to not be direct fish habitat are not discussed further but are included in **Table 2** for reference. **Table 3** provides a summary of the fish community documented through field investigations and background information review. A photographic log is provided in **Appendix C**. **Appendix A**, **Figure 2** illustrates the site conditions and locations of notable habitat features, opportunities, and constraints documented during field investigations. A summary table of the raw field data collected is provided in **Appendix D**.

3.2.1 15+975/16+035 Merrick Township – Little Sturgeon River

The watercourse flowed southwesterly underneath Highway 11 approximately 129 m northeast of Sand Dam Road. The feature was characteristic of a sinuous watercourse with oxbows and sandbars throughout that has been partially channelized. The thermal regime was identified as coldwater (MNR, 2024b). The flow regime was permanent, based on the size and clear channel definition of the watercourse.

Upstream (north) of the Highway 11 and Stewart Hammel Road was a straightened channel that appeared to have been excavated to redirect flow to an open-foot, 8 m span arch culvert (at 15+975), to create a perpendicular crossing for this watercourse possibly to alleviate flooding and/or washout of the highway where the original crossing at 16+035 was situated on a meander bend. The open-foot concrete arch conveyed flow through the straightened channel at 15+975.

Approximately 10 m north of the open foot arch culvert at 15+975 where the straightened diversion channel conveyed flow, what was presumed to be the original, natural meandering channel intersected with Highway 11 at approximately Station 16+035. This channel did not convey flow under the highway, but diverged from the straightened channel approximately 65 m upstream of Highway 11, intersected with Steward Hammel Road and Highway 11, and continued downstream in a sinuous channel for approximately 185 m before its confluence and reconnection with the straightened channel. Details are shown in **Figure 1A** of **Appendix A**. This channel can therefore also be described as a diversion or side channel of the main, straightened active channel crossing Highway 11 at Station 15+975. This watercourse was therefore assessed where the channelized diversion crossed Highway 11 at 15+975, and again where the original channel met and flowed along the ROW of Highway 11 at 16+035.

In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

3.2.1.1 15+975 Merrick Township – Little Sturgeon River

A natural sinuous watercourse flowed south to Stewart Hammel Road, where the straightened diversion channel crossed this road and conveyed flow through two 1.5 m corrugated steel pipe (CSP) culverts. At the time of the spring assessment and during higher flow conditions, these culverts were both nearly entirely submerged. Signs of erosion of this embankment as well as a sinkhole in Stewart Hammel Road were observed, and what appeared to be deposited embankment material in the watercourse.

Approximately 25 m from Stewart Hammel Road, this straightened channel was crossed again by Highway 11 via the 8 m span open foot concrete arch culvert. Within the upstream ZDA of the straightened channel, the morphology consisted entirely of flats. The substrate consisted of a mix of sand, silt, cobble, gravel, and boulder (in order of dominance). Coarse substrate was more prevalent in the thalweg and creekbed. The banks were slightly unstable and vulnerable to erosion, with some signs of erosion (e.g., exposed eroding material, point bars)

predominantly on the east bank and scour at the culvert inlet at Stewart Hammel Road. In-stream cover for fish was observed to be sparse in the spring, but improved visibility during lower flows during the summer assessment observed a moderate mean (60% cover) amount of in-stream cover consisting mainly of boulder/cobble, woody debris, and undercut banks. Riparian cover consisted of overhanging shrubs and herbaceous vegetation, including Speckled Alder (*Alnus incana*) and overhanging grasses, shading up to 30% of the channel. Aquatic vegetation was absent during the spring assessment, but Water Smartweed (*Persicaria amphibia*) was present in sparse amounts during the summer assessment. The surrounding land use other than the highway and access road was forest on the east bank, commercial property to the west, and on the west bank the watercourse was bordered by thicket swamp. Discarded bait containers also indicated use of the area for recreational angling, and a possible recreational access point at the road crossing (e.g., canoes, etc.). In this swamp on the west bank and north of Stewart Hammel Road were sections of finger channels and flooded pockets with hummocks of grasses and sedges (*Carex sp*.). During high flows of freshet in early spring, this swamp, with abundant grasses and hummocks in flooded finger channels, was suitable spawning habitat for Northern Pike.

During the summer assessment when water levels were lower, a bed of clean gravel substrate was observed near the inlet of the concrete arch culvert. This bed of gravel was suitable spawning material for Brook Trout. Juvenile Brook Trout were observed during fish community sampling, which further indicates the potential spawning and nursery function of the habitat. The mean channel dimensions between the spring and summer assessments were: 13.67 m mean wetted width (MWW), 1.9 m mean wetted depth (MWD), 14.3 m mean bankfull width (MBW), and 2.12 m mean bankfull depth.

Within the downstream ZDA of the straightened channel, the morphology consisted entirely of flats. The substrate consisted of a mix of gravel, boulder, sand, silt, and muck (in order of dominance). Coarse substrate was more prevalent in the thalweg and creekbed. The banks were slightly to moderately unstable and eroding (i.e., exposed material and slumping). In-stream cover for fish (mean 20% cover) was provided mainly by boulder and woody debris. Riparian cover consisted of Speckled Alder, providing shade and overhanging cover to 30%-59% of the channel. Aquatic vegetation was absent. The surrounding land use, other than the highway, was utilities corridor, thicket swamp, and forest. The mean channel dimensions were: 11.25 m MWW, 1.3 m MWD, 11.25 m MBW, and 1.3 m MBD.

Spill containment and cleanup measures (i.e., spill socks, containment boom) were observed on the water's surface in the downstream ZDA. These were observed in both the spring and the summer assessments. It is presumed these measures were deployed to address a spill in the watercourse, however it was undetermined whether they had been abandoned, or spill cleanup spanned over the course of the spring and summer.

3.2.1.2 16+035 Merrick Township – Unnamed Tributary to Little Sturgeon River

Within the upstream ZDA the channel of standing water diverted from the straightened channel and ran westerly, parallel to Highway 11 on the north side for approximately 68 m before intersecting with Highway 11. The morphology consisted entirely of flats with the following channel dimensions: 8.0 m MWW, 1.58 m MWD, 8.0 m MBW, and 1.68 m MBD. The substrate consisted (in order of dominance) of silt, sand, detritus, muck, boulder, and clay. In-stream cover for fish (mean 15% cover) was provided mainly by woody debris, boulder, and organic debris. The banks were slightly unstable and vulnerable to erosion. Riparian vegetation consisted of Speckled Alder, White Meadowsweet (*Spiraea alba*), Sweet Gale (*Myrica gale*), and overhanging grasses which provided overhanging cover and shade to 30%-59% of the channel. Aquatic vegetation was absent. The surrounding land use, other than the highway, consisted of forest and thicket swamp. Portions of the thicket swamp on the north bank between Highway 11 and Steward Hammel Road contained finger channels and hummocks of narrow vegetation inundated with water suitable for Northern Pike spawning habitat. Spill containment and cleanup measures (i.e., tarp and boom) were observed at the toe of the embankment slope and edge of the channel at the west bank. Erosional rills and gullies were observed on the highway embankment alongside the channel.

No crossing structure was observed where the channel intersected with the highway. Within the downstream ZDA, the channel of standing water continued parallel to the highway within the ROW for approximately 70 m before continuing southerly in a sinuous channel. The morphology consisted entirely of flats with the following channel dimensions: 10.6 m MWW, 1.16 m MWD, 10.65 m MBW, and 1.18 m MBD. The substrate consisted of silt, detritus, sand, muck, and gravel. In-stream cover for fish (mean 30% cover) was provided mainly by woody debris, aquatic vegetation, organic debris, and undercut banks (in order or dominance). Aquatic vegetation consisted of submergent and emergent grasses and sedges. The banks were mainly slightly unstable and vulnerable to erosion. Riparian vegetation consisted of Speckled Alder, White Meadowsweet, Sweet Gale, and overhanging grasses which provided overhanging cover and shade for up to 59% of the channel. The surrounding land use, other than the highway, consisted of utilities corridor, forest, and thicket swamp. Portions of the thicket swamp along both banks contained finger channels and hummocks of narrow vegetation inundated with water suitable for Northern Pike spawning habitat. Erosional rills and gullies were observed on the highway embankment alongside the channel, and embankment material deposited on the creekbed was observed within the ROW. A beaver dam observed downstream of the ZDA may be an impediment to fish passage.

3.2.2 12+725 Blyth Township – Unnamed Tributary to Little Sturgeon River

The watercourse was a channel flowing southeasterly through wetlands and crossing Highway 11 via a concrete pipe culvert (1.5 m diameter). The watercourse is characteristic of a permanent flow regime based on the clear and defined active channel. A designated thermal regime was not available from secondary sources or the MNR but is assumed to be coldwater based on the thermal regimes of similar, nearby watercourses of the watershed. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA and during the initial spring assessment, the channel morphology consisted of runs (75%) and pools (25%). During the lower flows of the summer assessment the run morphology had slowed to flats and pools. The mean channel dimensions of the majority of the ZDA between the spring and summer assessments were: 0.46 m MWW, 0.32 m MWD, 0.46 m MBW, and 0.49 m MBD, and in the pool at the culvert inlet 5.75 m MWW, 0.7 m MWD, 6.25 m MBW, and 0.86 m MBD. The substrate consisted of a mix of boulder, cobble, silt, sand, detritus, gravel, sand, muck, and clay (in order of dominance), with sand, gravel, and boulder more prevalent in the inlet pool. The in-stream cover for fish (mean 20% cover) consisted of woody debris, boulders, aquatic vegetation, and undercut banks. Aquatic vegetation consisted mostly of submergent grasses. The banks were mostly slightly unstable and vulnerable to erosion. Riparian vegetation consisted of shrubs, grasses, and herbaceous vegetation such as Speckled Alder, White Meadowsweet, goldenrod (*Solidago* sp.), Reed Canary Grass (*Phalaris arundinacea*), cattails (*Typha* sp.), Tamarack (*Larix laricina*), and Dark Green Bulrush (*Scirpus atrovirens*), which provided overhanging cover and shade to 60% - 89% of the channel. The surrounding land use, other than the highway, was mainly fen, thicket swamp wetland, and forest. Piled boulders were observed at the crest of the inlet pool which likely impeded fish passage, particularly during lower flows.

Within the downstream ZDA, the channel morphology consisted mostly of flats (80%) and pool at the culvert outlet. Minimal change in morphology was observed during the summer. The mean channel dimensions of the majority of the ZDA were: 0.75 m MWD, 3.5 m MWW, 0.98 m MBD, and 3.7 m MBW. The outlet pool was 0.9 m MWD, 4 m MWW, 1.15 m MBD, and 5 m MBW. The substrate consisted of (in order of dominance) detritus, muck, silt, sand, cobble, and gravel. The in-stream cover (mean 20% cover) consisted of woody debris, organic debris, and cobble. Aquatic vegetation was absent. The banks were stable, and riparian vegetation consisted of overhanging shrubs and sedges, which provided overhanging cover and shade to 30% - 89% of the channel. The surrounding land use, other than the highway, was utilities corridor, fen, thicket swamp wetland, and forest. Remnants of an inactive beaver dam were observed below the outlet pool but was not likely impeding fish passage.

3.2.3 13+400 Blyth Township – Unnamed Tributary to Little Sturgeon River

The watercourse was a channel conveying flow westerly across Highway 11 via a 1.3 m concrete pipe culvert on the upstream side of the highway. The watercourse exited the crossing structure through a 1.3 m x 1.2 m open foot concrete box culvert. It's presumed this concrete box culvert was extended on the upstream (northeast) side using the concrete pipe culvert. The watercourse conveyed flow westerly from a low-lying, saturated cattail marsh wetland and under the highway where it drained to a receiving online wetland that flowed southerly along the west side of the highway. The watercourse crossing the highway was characteristic of an intermittent flow regime, based on low flows, lack of defined channel outside of the ROW on the upstream side, and *Sphagnum* sp. moss growth on the bed of the channel. However, the short channel at the culvert outlet where it tied into the receiving wetland (and the receiving wetland itself) were characteristic of permanent flow regime, based on size, flow, and clearly-defined active channel. The surrounding land use, other than the highway, included utilities corridor, forest, and wetland. A designated thermal regime was not available from secondary sources or the MNR but is assumed to be coldwater based on the thermal regimes of similar, nearby watercourses of the watershed. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA and during the initial spring assessment, the channel morphology consisted entirely of runs. The mean channel dimensions of the ZDA in the spring were: 0.8 m MWW, 0.2 m MWD, 1.6 m MBW, and 0.35 m MBD. The channel was dry during the summer assessment. The substrate consisted of (in order of dominance) sand, gravel, silt, and boulder. The in-stream cover for fish (mean 30% cover) consisted of cobble, boulder, and woody debris. Filamentous algae was observed, but otherwise aquatic vegetation was absent. A low-lying water collection area from which the channel flowed was thick with cattail. The riparian vegetation consisted of shrubs and the adjacent forest which provided overhanging cover and shade to 60% - 89% of the channel, including Broadleaf Cattail (*Typha latifolia*), Tamarack, Speckled Alder, White Pine (*Pinus strobus)*, Eastern White Cedar (*Thuja occidentalis*), Black Spruce *(Picea mariana*), goldenrod, Tall White Aster (*Symphyotrichum ericoides*), St. Johns Wort (*Hypericum perforatum*), Dark Green Bullrush, Reed Canary Grass, Leatherleaf (*Chamaedaphne calyculata***)**, and Sweet Gale. The banks were stable and protected from erosion by rock and hard, non-erodible material. Aside from the seasonal fish passage impediment caused by low or intermittent flow, debris and blast rock at the culvert inlet were also impediments to fish passage. Furthermore, the culvert was positioned at a gradient and the resulting velocity created a permanent fish passage impediment.

Within the downstream ZDA and during the spring assessment, flow from the intermittent watercourse flowed for approximately 15 m through what appeared to be a straightened channel, that converged with the receiving wetland that flowed parallel to the highway. The morphology in the channel was entirely flats. The channel dimensions were: 0.65 m MWD, 2.35 m MWW, 0.9 m MBD, and 2.75 m MBW. The substrate was (in order of dominance) sand, silt, detritus, clay, gravel, and boulder. The banks were stable and protected from erosion by rock and hard, non-erodible bank material. In-stream cover in the channel (mean 15% cover) was provided mainly by woody debris, organic debris, and boulders. Aquatic vegetation was absent. Riparian vegetation included trees and saplings of the ROW, and provided overhanging cover and shade to 30%-59% of the channel.

The receiving online wetland was a dammed watercourse with a series of beaver ponds. Based on aerial imagery, the wetland in the ZDA was approximately 35 m wide. Within the ZDA (up to approximately 35 m downstream of the straightened channel input), the MWD was 0.75 m at the time of the summer assessment. The substrate consisted of (in order of dominance) muck and boulder, while on the shoreline cobble, boulder, gravel, bedrock, and sand were observed. In-water cover (mean 70% cover) was provided by aquatic vegetation, woody debris, cobble, and boulder. The aquatic vegetation consisted of emergent varieties, mainly cattail and bulrush (*Scirpus* sp.). The riparian vegetation included White Pine, Tamarack, White Meadowsweet, Red Maple (*Acer rubrum*), and vegetated hummocks of Leatherleaf and Sweet Gale. A beaver dam was observed approximately 34 m

downstream of the culvert outlet, and several dams could be seen from satellite imagery. The beaver dams may impede fish passage but are not likely a complete barrier.

3.2.4 15+512 Blyth Township – Unnamed Tributary to Tomiko River

The watercourse flowed westerly across Highway 11 via a 1.2 m x 0.8 m concrete box culvert (either open-foot or box culvert with accumulated deposited material) from a low-lying, saturated water collection area with cattail throughout. After exiting the culvert outlet, the watercourse shifted direction and continued northwesterly along the highway as an online wetland created by a series of beaver dams on the watercourse. The watercourse was characteristic of a permanent flow regime. Though the active channel was poorly-defined through the vegetation upstream (northeast) of the highway, substrate sorting and lack of vegetation in the channel indicated permanent flow. A designated thermal regime was not available from secondary sources or the MNR but is assumed to be warmwater based on the thermal regimes of similar, nearby watercourses of the watershed. The surrounding land use, other than the highway, was utilities corridor, forest, wetland, and recreational snowmobile trail. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA and during the spring assessment, the channel morphology consisted of flats and runs. The channel dimensions of the ZDA in the spring and summer were similar, with the exception of the wetted width which in the spring the low-lying cattail wetland area was wetted throughout and notably wider than in the summer (mean 20 m). Other than this saturated water collection area, the mean spring and summer channel dimensions were: 0.9 m MWW, 0.16 MWD, 1.1 MBW, and 0.18 m MBD. The substrate consisted of (in order of dominance) gravel, silt, muck, cobble, detritus, and boulder. Coarse substrate was more prevalent in the ROW and areas of run morphology. The in-stream cover for fish (mean 50% cover) consisted of boulder, woody debris, cobble, and overhanging and instream emergent vegetation including cattails, grasses, and sedges. The riparian vegetation consisted mainly of trees and shrubs of the adjacent forest and ROW, shading 60% - 89% of the watercourse and included Eastern White Cedar, Blue Spruce (*Picea pungens*), Sweet Gale, Speckled Alder, goldenrod, Tall White Aster, White Meadowsweet, Leatherleaf, grasses, Balsam Fir (*Abies balsamea*), White Birch (*Betula papyrifera*), Wild Strawberry (*Fragaria virginiana*), and Large Leaf Aster (*Eurybia macrophylla*). The banks were stable and protected from erosion by rock and hard, non-erodible material. Aside from the seasonal fish passage impediment caused by low flow, a rock and debris jam in the ROW may also impede fish passage. Discarded asphalt and remnants of a CSP were observed in the ROW. The boulder and cobble within the ROW appeared to be iron-stained, indicating groundwater inputs. Erosional gullies and rills were observed along the highway embankment.

Within the downstream ZDA, the watercourse changed direction at the culvert outlet and continued to the northwest as a well-defined straightened channel for approximately 40 m - 50 m within the ditchline in the ROW before draining to an open water pond of standing water in a large fen. The morphology in the channel was entirely flats. The channel dimensions were: 0.37 m MWD, 3 m MWW, 0.35 m MBD, and 2.43 m MBW. The substrate was (in order of dominance) gravel, detritus, sand, silt, muck, and boulder. Much of the gravel substrate observed in the channel appeared to be deposited embankment material as a result of the highway embankment erosional gullies and rills observed along the embankment. The banks were stable and protected from erosion from the riprap of the ditchline. In-stream cover in the channel was provided by woody debris, aquatic vegetation, organic debris, and boulder, cobble, and undercut banks. The available in-stream cover had significantly increased from spring (mean 30%) to summer (mean 85%) attributed to growth of emergent and submergent vegetation and particularly in or near the outlet to the ponded water of the fen, including grasses, sedges, cattail, bulrush, Common Bladderwort (*Utricularia vulgaris*), and Yellow Pond Lilly (*Nuphar lutea*). Riparian vegetation included Tamarack, cattail, White Meadowsweet, Leatherleaf, Bracken Fern (*Pteridium* sp.), Sweet Gale, sedges, Sheep Laurel (*Kalmia angustifolia*), St. Johns Wort, and Bog Cranberry *(Vaccinium oxycoccos)* which provided overhanging cover and shade to 29% - 89% of the watercourse. Seasonal low flows were likely an impediment to fish passage. Iron staining was observed on the rocks downstream of the outlet, indicating groundwater upwelling.

3.2.5 10+881 Notman Township – Unnamed Tributary to Little Tomiko River

The watercourse flowed southeasterly through thicket and treed swamp and crossed Highway 11 via a 1.8 m x 1.3 m concrete open foot box culvert. The watercourse was characteristic of a permanent flow regime based on its size and the clear and defined active channel. A series of beaver dams, some intact at the time of assessment and some breached, created sections in the ZDA of flow, and areas of impounded water. Based on satellite imagery, it appeared as though the channel in the ZGA downstream of the culvert may have previously been a sinuous channel meandering through the thicket swamp that has been straightened. This is based on the visible remnants of the meandering channel, and the uncharacteristically straight channel originating from the culvert outlet and traversing what remained of the meandering channel, up to approximately 150 m downstream. The thermal regime was identified as warmwater (MNR 2024b). Other than the highway, the surrounding land use was utilities corridor, forest, and wetland. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA, a beaver dam was present approximately 10 m upstream of the culvert inlet. Above the dam (i.e., the ZDA from 10 m – 20 m upstream of the culvert) was a pond of open water approximately 20.5 m (mean) wide and 25 m long, but the area of the wetland including saturated hummocks of vegetation and floating mats was approximately 50 m wide (mean). The substrate in the pond was mainly detritus, muck, and silt, with sand predominantly observed in the thalweg mid-pond, where from the ponded water overtopped the dam in the spring and flowed downstream. In the summer, the dam had been reinforced and prevented this overtopping, with only a smaller stream of flow circumventing the dam through the thicket swamp on the north side. The detritus, muck, and floating mats of vegetation were more prevalent bordering the ponded water. The floating mats of vegetation as well as woody debris provided cover to shoreline areas and shade (mean 1% - 29%). In-stream cover for fish within the ponded water (mean 20% cover) consisted mainly of aquatic vegetation, organic debris, and woody debris from the beaver dam, with trace amounts of boulder. Aquatic vegetation included mainly emergent grasses, sedges, cattails, Yellow Pond Lily, and Water Smartweed.

Within the upstream ZDA, flowing from the beaver dam for approximately 10 m before entering the culvert inlet was a defined channel, that flowed entirely as run morphology in the spring but flowed to entirely flats in the summer assessment as flow had decreased. The mean spring channel dimensions were 0.2 m MWD, 3.3 m MWW, 0.55 m MBD, and 3.2 m MBW. The substrate consisted of cobble, gravel, sand, boulder, silt, clay, detritus, and muck. Riparian vegetation was primarily terrestrial grasses and herbaceous vegetation including Speckled Alder, Sweet Gale, goldenrod, asters (*Aster* sp.), White Meadowsweet, and Jewelweed (*Impatiens capensis*) which provided overhanging cover and shade to 1% to 59% of the watercourse. In-stream cover for fish (mean 53% cover) was provided mainly by boulder, woody debris, aquatic vegetation, and undercut banks. The beaver dam was an impediment, but not likely a complete barrier to fish passage.

Within the downstream ZDA, the active channel bordered by shrub thicket swamp flowed as runs in the spring, but flat morphology was more prevalent in the summer. The mean channel dimensions were: 4.73 m MWW, 0.82 m MWD, 5.1 m MWB, and 1 m MBD. The substrate consisted of (in order of dominance) a mix of cobble, gravel, sand, boulder, silt, clay, detritus, and muck. Some signs of instability and erosion (e.g., undercutting) were observed on both banks. The in-stream cover (mean 48% cover) was provided mainly by woody debris, undercut banks, cobble, aquatic vegetation, and boulder. The riparian vegetation of the bordering thicket swamp shaded 30% - 89% of the channel and included a mix of overhanging shrubs, herbaceous vegetation, and grasses such as Speckled Alder, White Meadowsweet, cattails, goldenrod, sedges, Leatherleaf, and Sweet Gale. Along the right bank riparian area and adjacent wetland, narrow-emergent vegetation and vegetated hummocks of grasses and sedges were observed with pockets of water and finger channels throughout. When flooded during spring freshet, this area was suitable spawning habitat for Northern Pike. A breached beaver dam was observed in the ZDA which may impede passage but was not likely a barrier.

3.2.6 11+800 Notman Township - Unnamed Tributary to Little Tomiko River

The watercourse flowed northerly through cattail swamp and crossed Highway 11 via a 0.9 m x 1.3 m open foot concrete box culvert. The watercourse was characteristic of a permanent flow regime based on the presence of a defined, active channel, substrate sorting, and aquatic vegetation. The thermal regime was identified as warmwater (MNR, 2024b). Other than the highway, the surrounding land use was utilities corridor, forest, and wetland. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA, two active channels flowed through a saturated cattail swamp and converged at the culvert inlet. A mix of mainly run morphology with pools and flats were observed in these active channels. The channel dimensions of the ZDA in the spring and summer were similar, with the exception of the pool of water that accumulated at the embankment. The mean spring and summer channel dimensions were: 0.7 m MWW, 0.34 m MWD, 0.9 m MBW, and 0.53 m MBD. The pool at the embankment was (mean) 22 m wide and 0.3 m deep in the spring, and 5 m wide and 0.7 m deep in the summer. The substrate consisted of (in order of dominance) detritus, silt, boulder, sand, and muck. Coarse substrate was more prevalent in the ROW and areas of run morphology. The in-stream cover for fish (mean 43% cover) consisted of aquatic vegetation, organic debris, cobble, boulder, undercut banks, and organic debris. Submergent, emergent, and floating vegetation were present throughout the active channels as well as the mats of vegetation of the swamp, including: cattail, Canada Waterweed (*Elodea canadensis*), grasses, sedges, algae, and Dark Green Bullrush. Riparian cover provided by the wetland vegetation bordering the channels consisted mainly of overhanging herbaceous vegetation, grasses, sedges, and shrubs including Speckled Alder, Leatherleaf, and Sweet Gale which shaded 1% - 59% of the channels. Both banks were either stable with areas vulnerable to erosion, or slightly unstable with some undercutting. A steel grate covered the culvert inlet, where debris accumulated and impeded fish passage.

Within the downstream ZDA of the highway, the watercourse continued in a single active channel through saturated cattail swamp. Up to approximately 50 m downstream of the culvert was an inactive, breached beaver dam. Below the beaver dam the watercourse continued through the ZGA as a well-defined channel through forest, suggesting the cattail swamp at one time may have been a beaver pond. Downstream of the beaver dam in the ZGA, beds of clean gravel substrate suitable for Brook Trout spawning habitat were observed. The morphology of the channel was runs and flats. The mean channel dimensions between the spring and summer were similar with the following mean dimensions: 1.3 m MWW, 0.25 m MWD, 1.14 m MBW, and 0.34 m MBD. Portions of both banks were noted to be slightly unstable and vulnerable to erosion where undercutting was observed. In-stream cover (70% mean cover) was provided mainly by aquatic and overhanging vegetation, cobble, woody debris, boulder, and undercut banks. Wetland vegetation bordering the active channel and providing riparian cover included overhanging grasses, sedges, cattail, Speckled Alder, White Meadowsweet, Flat-topped White Aster (*Doellingeria umbellate*), Broadleaf Cattail, Sensitive Fern (*Onoclea sensibilis*), Canada Goldenrod (*Solidago canadensis*), grasses, and sedges. Seasonal low flows were an impediment to fish passage.

3.2.7 12+541 Notman Township – Unnamed Tributary to Little Tomiko River

The watercourse was a low-lying water collection area with cattails throughout at the highway embankment that flowed southwesterly across Highway 11 via a 0.9 m wide concrete box culvert. From the culvert outlet, water collected in a low-lying area before continuing in a poorly-defined channel through the forest. The watercourse was characteristic of an intermittent flow regime, based on the lack of channel definition, but sufficient substrate sorting and change in vegetation to suggest regular flow. A designated thermal regime was not available from secondary sources or the MNR but is assumed to be warmwater based on the thermal regimes of similar, nearby watercourses of the watershed. The surrounding land use, other than the highway, was utilities corridor, forest, and

wetland. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA, the watercourse flowed through a mixed forest and collected in a low-lying area with cattails throughout at the highway embankment. The watercourse flowed from this area of pooling water and cattails in a defined channel in the ditchline to the culvert. The mean channel dimensions were 0.25 m MWD, 3 m MWW, 0.4 m MBD, and 3.2 m MBW. The morphology throughout the cattail stand and channelized watercourse in the ditchline was flats throughout. The substrate consisted of (in order of dominance) detritus, muck, and silt. In-stream cover (70% mean cover) was provided by emergent aquatic vegetation and organic debris. The banks were stable and protected from erosion by the riprap in the ditchline. The riparian cattails and sedges throughout the feature paired with the forest canopy provided little overhanging cover or shade to the feature (up to 29%). There were remnants of an old beaver dam that did not influence flow or impede fish passage. Fish passage however was likely impeded by seasonal low flows.

Within the downstream ZDA from the culvert outlet for approximately 35 m, the watercourse continued to flow in run and flat morphology through the ditchline where water collected in a cattail stand, similar to the upstream ZDA. Similar vegetation and cover (90% mean) to those observed in the upstream ZDA were observed in the ditchline. The banks were stable and protected from erosion by the riprap in the ditchline. The substrate consisted of approximately equal parts detritus, silt, and muck. The mean channel dimensions were 0.2 m MWD, 4.2 m MWW, 0.35 m MBD, and 4.5 m MBW. Once the flow changed direction and entered the forest from the ditchline, the channelized watercourse dissipated and widened into a low-lying area and lacked channel definition. However, some substrate sorting and aquatic vegetation including submergent and emergent grasses, and sedges were observed. This low-lying area of run and pool morphology occupied the remainder of the ZDA, before the watercourse continued in the forest in the ZGA in a poorly-defined channel. The mean dimensions of the low-lying wetted area were 0.15 MWD, 11 m MWW, 0.25 m MBD, and 12 m MBW. The substrate consisted of (in order of dominance) detritus, muck, and silt. In-stream cover for fish in this section (50% mean cover) was provided mostly by organic debris and woody debris, with only trace amounts of aquatic vegetation. The riparian vegetation consisted of trees and shrubs of the adjacent forest which provided overhanging cover and shade to 30% - 59% of the watercourse. The low flows observed in this section, as noted in the upstream ZDA, is a likely seasonal impediment to fish passage. Steep gradient observed in the ZGA, however, is likely a permanent impediment to upstream fish movement from below the slope.

3.2.8 14+073 Notman Township - Unnamed Tributary to Little Tomiko River

The watercourse was a straightened channel through a fen that appeared to have been dredged to create the drainage channel possibly to improve drainage from the highway. The watercourse is characteristic of a permanent flow regime based on the size and dimensions, clear bank definition, substrate sorting, and change in vegetation. These characteristics were observed only on the southwest (downstream) side of Highway 11. Upstream of the highway, surface water collected in a saturated, low-lying area at the highway embankment, with cattails and sedges throughout. No open water or indication of channel formation, regular flow, or access for fish including from downstream of the culvert was observed. The area was dry during summer assessment. A pile of riprap was observed immediately at the culvert inlet. Detailed assessment was completed where fish habitat potential was present in the downstream ZDA. Other than the highway, the surrounding land use included utilities corridor, forest, and wetland. A designated thermal regime was not available from secondary sources or the MNR but is assumed to be warmwater based on the thermal regimes of similar, nearby watercourses of the watershed. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the downstream ZDA the single, straightened and dredged channel flowed southwesterly through an extensive fen wetland. The channel morphology was pools and flats, with water pooling and feature widening at the

highway embankment. The mean channel dimensions were: 1.35 m MWD, 4.3 m MWW, 1.75 m MBD, and 4.9 m MBW. The substrate was a mix of muck and detritus. The banks were noted to be vulnerable to erosion and slightly unstable. The in-stream cover (mean 50% cover) was provided by organic debris, aquatic vegetation, and woody debris. The riparian vegetation was comprised of the wetland vegetation, shrubs, and trees of the fen bordering the channel on either side which provided overhanging cover and shade to 30% - 59% of the channel. Riparian vegetation of the bordering fen included cattails, Tamarack, Speckled Alder, Flat-top White Aster, Red Raspberry (*Rubus idaeus*), Reed Canary Grass, Fireweed (*Chamaenerion angustifolium*), bulrush, Sensitive Fern, Canada Goldenrod (*Solidago canadensis*), and Black Spruce (*Picea mariana*). Emergent and floating aquatic vegetation including cattails and bulrush were observed in wetted areas of the fen bordering the channel. Low flow through the culvert and a pile of riprap at the culvert inlet are likely impediments to fish passage.

3.2.9 14+408 Notman Township - Unnamed Tributary to Little Tomiko River

The straightened watercourse at crossing 14+408 Notman Township flowed easterly parallel to the highway embankment in the ditchline on the west side, with some flow crossing the highway through a 0.9 m x 1.1 m open foot concrete box culvert and flowing northerly through the forest, as well as continuing easterly along the ditchline. Other than the highway, the surrounding land use was utilities corridor, forest, and wetland. The watercourse was characteristic of an intermittent flow regime, based on the low flows observed and terrestrial vegetation grown on the channelbed. A designated thermal regime was not available from secondary sources or the MNR but is assumed to be warmwater based on the thermal regimes of similar, nearby watercourses of the watershed. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA and during the spring assessment, the channel flowed parallel to the highway in the ditchline, the morphology was entirely flats. The mean channel dimensions were: 0.15 m MWD, 2.2 m MWW, 0.45 m MBD, and 3.2 m MBW. During the summer, this section was dry other than an approximately 8 m long isolated pool of standing water. The substrate was a mix of (in order of dominance) silt, sand, detritus, muck, boulder, and clay. In-stream cover (80% mean cover) was provided mostly by aquatic vegetation, as well as organic debris and boulders. In-stream vegetation included emergent grasses and cattail, algae, and Common Bladderwort. The banks were mainly stable and protected by coarse material of the ditchline. Riparian vegetation along the ditchline provided minimal overhanging cover and shade (up to 29%), provided by shrubs/saplings and cattails. Erosional rills and gullies were observed along the highway embankment that may have resulted in embankment material deposited in the channel and/or transported downstream.

Within the downstream ZDA, was a straightened channel either dug or blasted through rock, directing flow northerly where it drained to another watercourse. The channel was dry during the summer assessment, aside from an isolated pool at the culvert outlet. During the spring assessment, water flowed in entirely flat morphology. The mean channel dimensions were: 0.15 m MWD, 0.8 m MWW, 0.25 m MBD, and 1.3 m MBW. The substrate consisted of (in order of dominance) silt, sand cobble, detritus, muck, and bedrock. In-stream cover for fish (mean 45% cover) was provided by organic debris, woody debris, boulder, and cobble. The channel was shaded by the trees of the adjacent forest, but the understorey shrubs and herbaceous vegetation provided overhanging cover for up to 59% of the channel. The banks were slightly unstable, and riparian vegetation from the adjacent forest included Bracken Fern, Red Maple, Tamarack, and Canada Goldenrod. Aquatic vegetation was scarce and included only a few cattails in the outlet pool and algae. The low flows observed are likely a seasonal impediment to fish passage.

3.2.10 14+926 Notman Township - Unnamed Tributary to Little Tomiko River

The straightened watercourse at 14+926 collected and conveyed flow directed from the ditchline on the west side of Highway 11 from the north and the south. During the spring assessment, flow was more prevalent along the ditchline from the south, where it crossed an entrance driveway via a CSP culvert before draining across the

highway via 0.9 m x 0.9 m concrete box culvert. Other than the highway, the surrounding land use was utilities corridor, forest, and wetland. The watercourse was characteristic of an intermittent flow regime based on the low flows observed. Though a defined and clearly-formed active channel was observed downstream of the highway, considering the feature was dry during summer assessments, terrestrial vegetation grown on the bed was observed, and the channel dissipated into a low-lying, saturated stand of cattails that lacked any visible channel formation or open water. A designated thermal regime was not available from secondary sources or the MNR but is assumed to be warmwater based on the thermal regimes of similar, nearby watercourses of the watershed. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA and during the spring assessment, water flowed northwesterly along the ditchline and crossed the MTO entrance driveway before converging with drainage in the ditchline heading southeast. During the spring assessment, the morphology was entirely runs with the exception of pooling water at the inlet. During the summer assessment, the drainage ditch was dry and overgrown with cattails. The spring mean channel dimensions were: 0.05 m MWD, 1.4 m MWW, 0.15 m MBD, and 1.7 m MBW. In the inlet pool of standing water was 0.3 m MWD, 1.2 m MWW, 0.45 m MBD, and 1.4 m MBW. The substrate in the outlet pool was entirely boulder, and through the remainder of the ZDA was (in order of dominance) gravel, boulder, and sand. The banks were stable and protected from erosion by the riprap and other hard material of the ditchline. In-stream cover for fish (mean 30% cover) was provided mainly by boulder and aquatic vegetation including emergent sedges and cattails that were abundant throughout the ZDA. The emergent vegetation provided little (up to 29%) shade and overhanging cover to the channel. Several impediments to fish passage were observed. Low flows and dry summer conditions are seasonal impediments to fish passage. The entrance culvert was severely perched and was a permanent barrier to fish passage. Furthermore, a pile of riprap, possibly to control sediment transport, laid across the ditch and channel upstream of the entrance culvert, and impeded fish passage. Erosional rills and gullies were observed along the highway embankment, and what appeared to be deposited embankment material was observed on the bed of the channel.

Within the downstream ZDA up to approximately 25 m downstream of the culvert outlet, a channel ran northerly through forest before dissipating through a saturated, low-lying cattail stand. During the summer assessment, both the channel and the cattail stand were dry, with only occasional, small and shallow puddles of water in the channel. During the spring assessment, the morphology in the channel was nearly entirely runs with the exception of a pool at the culvert outlet. The mean channel dimensions were: 0.05 m MWD, 0.95 m MWW, 0.1 m MBD, and 1.1 m MBW. The pool of water at the culvert outlet was 0.25 m MWD, 0.6 m MWW, 0.5 m MBD, and 0.65 m MBW. The substrate in the pool was cobble, and throughout the remainder of the channel consisted of (in order of dominance) sand, gravel, silt, cobble, and bedrock. Erosional rills and gullies were observed at the highway embankment and scour of the bank at the culvert outlet were observed. The gravel and sand substrate appeared to be highway embankment material that had eroded, transported, and deposited on the bed of the channel. These beds of clean gravel and sand substrate, however, did appear to be suitable spawning material for Brook Trout. The banks were stable, though vulnerable to erosion with some mild undercutting observed on both the left and right banks. In-stream cover for fish (20% mean cover) was provided by cobble, woody debris, aquatic and overhanging riparian vegetation, and undercut banks. The aquatic vegetation observed included submergent and emergent grasses and sedges. Riparian vegetation consisted of overhanging grasses and shrubs, and provided shade, overhanging, and some in-stream cover to 60% - 89% of the channel. Erosional gullies and rills were observed along the highway embankment with indication of material deposited on the bed of the channel. In addition to the fish passage impediment created by low flows, slope gradient and lack of channel formation was an impediment to fish passage where the flow entered the cattail stand.

From 25 m to 50 m downstream of the culvert was the cattail stand surrounded by treed fen. Based on aerial imagery, the wetland is approximately 35 m wide and 130 m long. The cattail stand was saturated with water, but choked with cattail and no channel formation or indication of any open water was observed. Access for fish to the

wetland is unknown. The substrate was composed of silt, detritus, and muck. In-stream cover was high and provided by the abundance of emergent vegetation (i.e., mainly cattails, as well as emergent sedges and grasses) and woody debris, and organic debris.

3.2.11 16+060 Notman Township - Unnamed Tributary to Elbow Lake (Tomiko River)

This watercourse was an online wetland that is intersected by Highway 11. Water was impounded at the highway embankment on the northeast side and created an open-water pond. No water crossing structure was visible in the highway embankment, and water was observed flowing through the large rock of the highway embankment. It is unknown whether a structure was present or was submersed/buried. The watercourse was characteristic of a permanent flow regime, based on the size, observed flow, substrate sorting, and vegetation composition. The thermal regime was identified as warmwater (MNR 2024b). The surrounding land use, other than the highway, was utilities corridor, forest, and wetland. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA an open-water pond of standing water approximately 120 m wide (mean) was present and extended the length of the ZGA. The mean depth of the pond at the highway embankment during the spring assessment was 1.25 m and the mean shoreline along the pond perimeter was 0.45 m. The shoreline and pond bed substrate consisted mainly of muck, detritus, silt, and boulder, though boulders and cobble were more prevalent along the shorelines and highway embankment, and muck/detritus were the dominant substrate distal from the shorelines and embankment. In-water cover for fish (75% mean cover) was provided by woody debris, aquatic vegetation, boulder, and organic debris. Submergent and emergent aquatic vegetation were present and included Canada Waterweed, Water Smartweed, arrowhead (*Sagitaria* sp.), Water Arum (*Calla palustris*), and Soft-stem Bulrush (*Schoenoplectus tabernaemontani*). Shoreline cover was scarce during the spring, but during the summer season and vegetation growing season was provided by riparian shrubs and herbaceous vegetation, boulder, and woody debris. Riparian vegetation included Speckled Alder, Sweet Gale, Eastern White Cedar, Balsam Fir, and Reed Canary Grass. A series of beaver dams were observed using satellite imagery well outside of the ZGA, which may impede fish passage. The lack of or buried highway crossing structure is a permanent barrier to fish passage. A section of flooded shoreline with hummocks of narrow-emergent vegetation was observed along the north bank near the intersection with the highway embankment, which may be suitable spawning habitat for Northern Pike. However, given the series of beaver dams upstream that may impede fish passage and the highway embankment restricting access from Elbow Lake downstream, access to this habitat for Northern Pike is not anticipated.

Within the downstream ZDA, water flowed from the highway embankment and along the ditchline for approximately 10 m before continuing westerly through thicket. The 10 m of channel within the ROW flowed entirely as run morphology and over sand and boulder substrate. The mean channel dimensions in this reach were: 0.2 m MWD, 1.5 m MWW, 0.18 m MBD, and 0.9 m MBW. The banks were stable and protected by the hard material of the ditch and embankment. In-stream cover (60% mean cover) consisted of boulder, aquatic vegetation, and organic debris. The aquatic vegetation consisted mainly of cattails, which provided 30% - 59% overhanging shade and cover to the channel paired with the shrubs in the ROW and riparian area. Erosional gullies and rills were observed along the embankment. Sand and gravel that appeared to be eroded embankment material were also observed deposited in the thicket, channel, and the adjacent forest.

From where the watercourse diverged from the ditch into the wetland, one main channel and multiple smaller flow paths travelled through and occasionally intersected with each other through cattail and Speckled Alder thicket wetland. In the main channel, water flowed in entirely flat morphology. The mean channel dimensions were: 0.4 m MWD, 1.2 m MWW, 0.6 m MBD, and 1.45 m MBW. Based on satellite imagery, the mean width of the thicket wetland in the ZDA was ~70 m. The substrate (in order of dominance) was sand, silt, detritus, and clay. The banks

were moderately unstable and vulnerable to erosion. Some signs of erosion were observed (i.e., vertical banks of exposed bank material, slumping banks, undercut banks). In-stream cover (60% mean) was provided by (in order of dominance) undercut banks, organic debris, and woody debris. Aquatic vegetation was absent from the channel(s), other than the abundant cattail and some sedges throughout the thicket wetland. The cattail and riparian shrubs shaded and provided overhanging cover to 60% - 89 % of the channel, including Speckled Alder, Spotted Joe Pye Weed (*Eutrochium maculatum*), Jewelweed, goldenrod, Canada Mint (*Mentha canadensis*), and Sensitive Fern. The channels converged again into a single channel at approximately 40 m downstream of the highway embankment and continued flowing west. Series of beaver dams were visible using satellite imagery outside of the ZGA. Accumulated debris and seasonal low flows in the channel were seasonal impediments to fish passage.

3.2.12 16+278 Notman Township - Unnamed Tributary to Elbow Lake (Tomiko River)

Water from the treed conifer swamp on the northeast (upstream) side of Highway 11 pooled in a catchment area at the highway embankment. Water collected in the pool and flowed across Highway 11 via a 1.8 m x 1.5 m concrete box culvert, and continued southwesterly in a defined channel through treed conifer swamp. No clear, single active channel on the upstream side of the highway and contributing flow to the pool was observed. However, based on the size, flow, dimensions, substrate sorting, and lack of vegetation, flow regime of this pool and the channel on the downstream/southwest side flowing downstream of the highway is presumed to be permanent. A designated thermal regime was not available from secondary sources or the MNR but is assumed to be warmwater based on the thermal regimes of the adjacent watercourses. In general, other than typical seasonal changes and unless otherwise stated, the physical conditions observed during the spring and summer assessments were consistent.

Within the upstream ZDA, water pooled at the highway embankment. No clear, single channel providing direct input to the pool was found but was surrounded by a low-lying catchment area and conifer swamp from which water seeped into the pool. Typical of the higher flows of spring, the pool was larger in width and depth than that observed in the summer, flooding the surrounding moss hummocks of the conifer swamp. During the spring the mean wetted depth of the pool and the surrounding flooded areas was 1.1 m, and maximum depth in the pool 1.5 m – 2 m. In the summer the pool had reduced in size to 6 m MWW and 1.6 m MWD. The substrate in the pool was (in order of dominance) detritus, muck, sand, and silt. In-water cover (mean 70% - 75% cover) was provided mostly by woody debris, as well we organic debris, overhanging vegetation and algae, and undercut banks. Scour and some undercutting was noted on both banks of the inlet pool, which were slightly unstable and vulnerable to erosion. Riparian vegetation providing overhanging cover, shade, and some in-stream cover included Speckled Alder, Sensitive Fern, Black Spruce, Balsam Fir, Canada Mint, Field Strawberry (*Fragaria vesca*), and *Sphagnum* sp. moss. The banks were mainly stable and protected by coarse material of the ditchline. Riparian vegetation along the ditchline provided minimal overhanging cover and shade (up to 29%), provided by shrubs/saplings and cattails. Erosional rills and gullies were observed in the highway embankment, and the sand substrate in the pool may be remnants of deposited embankment material. Low flow and accumulated debris at the culvert inlet were likely seasonal impediments to fish passage.

During the summer assessment and within the downstream ZDA, the watercourse flowed southwesterly through conifer swamp in entirely run morphology that widened as the channel progressed downstream through the ZDA. The mean channel dimensions were 0.15 MWD, 0.5 m MWW, 0.75 m MBD, and 3 m MBW. The substrate consisted of (in order of dominance) detritus, gravel, cobble, silt, sand, and boulder. The in-stream cover (mean 80% cover) was provided mainly by woody debris, cobble, boulder, organic debris, and undercut banks. The banks were moderately unstable and vulnerable to erosion or signs of erosion were observed (e.g., undercut and scoured banks). Overhanging cover 30% - 59%) was provided by woody debris and riparian vegetation of the swamp including Speckled Alder, Red Maple, Balsam Fir, Black Spruce, Skunk Currant (*Ribes glandulosum*), Mountain Maple (*Acer spicatum*), Marsh Fern (*Thelypteris palustris*), and White Birch (*Betula papyrifera*). Erosional rills and

gullies were observed in the highway embankment, and the gravel and sand substrate observed may be deposited embankment material that had eroded into the watercourse. The outlet of the culvert on the downstream side was buried and not visible and impeded both flow and fish passage from upstream.

During the spring assessment access throughout the wetland was restricted; the downstream ZDA was therefore assessed where accessible up to 10 m downstream of the highway embankment. The buried culvert and accumulated debris impeded flow and fish passage from the upstream side. The channel morphology in the spring was a mix of run and riffles, as opposed to the flats observed in the summer and attributed to the higher flows. The channel dimensions observed in this 10 m ZDA in the spring were: 0.13 m MWD, 1.05 m MWW, 0.23 m MBD, and 1.5 m MBW. Other than the typical variations in seasonal flow conditions, the physical conditions observed in this reduced assessment area during the spring were consistent with those observed during the summer assessment.

Table 2: Existing Fish and Fish Habitat Existing Conditions Summary Table (Template D2A)

Waterbody	Date (dd/mm/yyyy)	Flow	Thermal Regime	Fish Habitat[1]	Substrate Type[2]	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat
Fish Habitat									
15+975/16+035 **Merrick Township** **Little Sturgeon River** *Same water feature, combined assessment sites including natural channel filled in for highway causeway (16+035) and dug straightened channel made for crossing structure at 15+975	■ 03/05/2024 ■ 08/08/2024	■ Permanent	■ Cold (MNR 2024b)	■ Direct	■ **Upstream:** Sand, silt, cobble, gravel, boulder, detritus ■ **Downstream:** Sand, silt, boulder, gravel, muck	**Spring and Summer** ■ Upstream: Flats (100%) ■ Downstream: Flats (100%)	**Upstream** ■ **Riparian**: Speckled Alder (*Alnus incana*), Red Osier Dogwood (*Cornus sericea*), Red Pine (*Pinus resinosa)*, Reed Canary Grass (*Phalaris arundinacea)*, Queen Anne's Lace (*Daucus carota*), Fireweed (*Chamaenerion angustifolium),* White Meadowsweet *(Spirea alba),* Sweet Gale *(Myrica gale)* ■ **Instream:** Emergent vegetation (Water Smartweed [*Persicaria amphibia*) was present, but sparse. Emergent and submergent grasses and sedges (*Calix spp*.) more prevalent inside channel at 16+035 **Downstream** ■ **Riparian**: Speckled Alder	■ Material deposition and embankment erosion/sink hole of the access road in the upstream zone of detail assessment (ZDA). Habitat could benefit from embankment stabilization. ■ Twin culverts at access road were nearly submerged. Evaluate sizing of the twin culverts. ■ Erosion gullies and deposited embankment material observed in the right-of-way (ROW). Habitat could benefit from embankment stabilization. ■ Habitat could benefit from garbage cleanup, including spill socks that may have been abandoned (present during both spring and summer assessment), or additional measures to clean up spill (hydrocarbon sheen observed). ■ Beaver dam in downstream ZDA at confluence with 16+035 side channel impeding (but not completely restricting) fish passage into the side channel	■ Juvenile Brook Trout (*Salvelinus fontinalis*) captured during summer assessment, and clean gravel suitable for spawning was observed within the ROW. Suitable spawning and nursery habitat for Brook Trout were both observed. ■ Hummocks of narrow-emergent vegetation suitable for Northern Pike (*Esox lucius*) spawning habitat were present in the finger channels and flooded pockets between the main channel at 15+975, and side channel at 16+035, in both upstream and downstream ZDA. ■ Some bank erosion and instability were noted in the upstream and downstream ZDA.
12+725 **Blyth Township** Unnamed Tributary to Little Sturgeon River	■ 29/04/2024 ■ 06/08/2024	■ Permanent ■	■ Cold	■ Direct	■ **Upstream:** Boulder, cobble, silt, sand, detritus, gravel, sand, muck, Clay ■ **Downstream:** Detritus, muck, silt, sand, cobble, gravel	**Spring** ■ **Upstream:** Pool (25%), Run (75%) ■ **Downstream:** Pool (20%) Flats (80%) **Summer** ■ **Upstream:** Pool (40%), Flats (60%) ■ **Downstream:** Flats (60%), Pool (40%)	**Upstream** ■ **Riparian:** Speckled Alder, Broadleaf Cattail (*Typha latifolia*), goldenrod (*Solidago* sp.), aster (*Aster* sp.), Blue Vervain (*Verbena hastata*), Pearly Everlasting (*Anaphalis margaritacea*), Sensitive Fern (*Onoclea senesibilis*), Tamarack (*Larix laricina*), White Meadowsweet, Red Maple (*Acer rubrum*), Dark Green Bullrush (*Scirpus atrovirens*), Reed Canary Grass, Bracken Fern (*Pteridium auilinum*), Ox Eye Daisy (*Leucanthemum vulgare*) ■ **Instream:** Submergent grasses **Downstream** ■ Riparian: Speckled Alder, cattail (*Typha* sp.), goldenrod, aster, Blue Vervain, Pearly Everlasting, Sensitive Fern, Tamarack, White Meadowsweet, Red Maple, Dark Green Bulrush (*Scirpus atrovirens*). ■ Instream: absent	■ Boulders at pool crest in upstream ZDA possible fish passage impediment during low flows. Consider removing boulders to improve fish passage.	■ Boulders in upstream ZDA may be impediment to fish passage during low flows.

Waterbody	Date (dd/mm/yyyy)	Flow	Thermal Regime	Fish Habitat[1]	Substrate Type[2]	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat
13+400 **Blyth Township** **Unnamed Tributary to Little Sturgeon River**	■ 07/08/2024 ■ 30/04/2024	■ Upstream: Intermittent ■ Downstream: Permanent	■ Cold	■ Direct	■ **Upstream:** Sand, gravel, silt, boulder ■ **Downstream:** Detritus, cobble, gravel, sand, silt, boulder, clay	**Spring** ■ **Upstream**: Run (100%) ■ **Downstream:** Flats (100%) **Summer** ■ **Upstream**: Dry ■ **Downstream** (in wetland): 100% flats	**Upstream** ■ **Riparian:** Broadleaf Cattail, Tamarack, Speckled Alder, White Pine (*Pinus strobus)*, Eastern White Cedar (*Thuja occidentalis*), Black Spruce *(Picea mariana*), goldenrod, Tall White Aster (*Symphyotrichum ericoides*), St. Johns Wort (*Hypericum perforatum*), Dark Green Bullrush, Reed Canary Grass, Leatherleaf (*Chamaedaphne calyculata***)**, Sweet Gale ■ Instream: absent **Downstream** ■ **Riparian:** Reed Canary Grass, Leatherleaf, Sweet Gale along flooded banks in wetland. ■ **Instream:** cattail, bulrush (*Scirpus* sp.)	■ Boulder and debris obstruction at culvert inlet is potentially restricting flow into the culvert and could be a fish passage impediment. Consider clearing boulders and debris. ■ Beaver dam downstream of culvert outlet may impede fish passage in low flow conditions. ■ Gradient, velocity, and low flow in culvert likely permanent impediment to fish passage. ■ Potential seasonal impediment to fish passage from low/intermittent flow.	■ Groundwater indicator observed on the wetland shoreline downstream of culvert.
15+512 **Blyth Township** **Unnamed Tributary to Tomiko River**	■ 30/04/2024 ■ 08/08/2024	■ Permanent	■ Warm	■ Direct	■ **Upstream:** Gravel, silt, muck, cobble, detritus, boulder ■ **Downstream:** Gravel, detritus, sand, silt, muck, boulder	**Spring** ■ Upstream: Flats (50%), Run (50%) ■ Downstream: Flats (100%) **Summer** ■ Upstream: Flats (100%) ■ Downstream: Flats (100%)	**Upstream** ■ **Riparian:** Eastern White Cedar, Blue Spruce (*Picea pungens*), Sweet Gale, Speckled Alder, Goldenrod, Tall White Aster, White Meadowsweet, Leatherleaf, grasses, Balsam Fir, White Birch (*Betula papyrifera*), Strawberry (*Fragaria ananassa*), Large Leaf Aster (*Eurybia macrophylla*) ■ **Instream**: Cattail, grasses, sedges **Downstream** ■ **Riparian:** Tamarack, Broadleaf Cattail, White Meadowsweet, Leatherleaf, Bracken Fern, Sweet Gale, sedges, Sheep Laurel (*Kalmia angustifolia*), St. Johns Wort, Bog Cranberry *(Vaccinium oxycoccos*). ■ **Instream**: Broadleaf Cattail, Softstem Bulrush (*Scholoenoplectus tabernaemontani*), Dark Green Bullrush, Yellow Pond Lily (*Nuphar lutea),* Common Bladderwort (*Utricularia vulgaris),* submergent grasses, algae	■ Erosional gullies along highway embankment and observations of deposited material into the feature. Habitat could benefit from embankment stabilization. ■ Rock and woody debris jam may impede fish passage. Consider clearing debris. ■ Discarded asphalt and remnants of a CSP were observed in the ROW. Consider removing discarded material. ■ Potential seasonal fish passage impediment caused by low flow.	■ Iron staining – potential groundwater indicator. ■ Potential seasonal low flow impediment to fish passage.

Waterbody	Date (dd/mm/yyyy)	Flow	Thermal Regime	Fish Habitat[1]	Substrate Type[2]	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat
10+881 **Notman Township Unnamed Tributary to Little Tomiko River**	■ 01/05/2024 ■ 09/08/2024	■ Permanent	■ Warmwater (MNR 2024b)	■ Direct	■ **Upstream:** Beaver pond – detritus, muck, sand. Channel – gravel, sand, boulder. ■ **Downstream:** Cobble, gravel, sand, boulder, silt, clay, detritus, muck	**Spring** ■ Upstream: Run (50%), Flats (50%) ■ Downstream: Run (100%) **Summer** ■ Upstream: Flats (100%) ■ Downstream: Flats (100%)	**Upstream** ■ **Riparian:** Speckled Alder, Sweet Gale, Goldenrod, Asters, Bulrush, Cattails, White Meadowsweet, Jewelweed (*Impatiens capensis)*, American Bullweed (*Lycopus americanus*), Reed Canary Grass, Fireweed ■ **Instream:** Broadleaf Cattail, Yellow Pond Lily, Water Smartweed **Downstream** ■ **Riparian**: Speckled Alder, Steeple Bush (*Spiraea tomentosa*), White Meadowsweet, Broadleaf Cattail, Goldenrod, sedges., St. Johns Wort, Leatherleaf, Sweet Gale, Black Spruce, Tamarack, Smooth Brome, Grasses ■ **Instream:** Water Smartweed, White Water Lily (*Nymphaea alba)*, Broadleaf Cattail, sedges	■ Beaver dam was a possible impediment, but not likely a complete barrier to fish passage.	■ Suitable spawning habitat for Northern Pike in narrow-emergent and riparian vegetation on the north bank in downstream ZDA. ■ Beaver dam upstream and downstream may be impediment to fish passage.
11+800 **Notman Township Unnamed Tributary to Little Tomiko River**	■ 02/05/2024 ■ 12/08/2024	■ Permanent	■ Warmwater (MNR 2024b)	■ Direct	■ **Upstream:** Detritus, silt, boulder, sand, muck ■ **Downstream:** Sand, gravel, detritus, silt, cobble, boulder	**Spring** ■ Upstream: Pool (25%), Run (75%) ■ Downstream: Run (100%) **Summer** ■ Upstream: Flats (40%), Pool (20%), Run (40%) ■ Downstream: Flats (50%), Run (50%)	**Upstream** ■ **Riparian:** Broadleaf Cattail, St. John's Wort, Speckled Alder, Smooth Brome, Tall White Meadowsweet, Joe-pye-weed, Goldenrod, Flat Top White Aster ■ **Instream:** Broadleaf Cattail, Clubhead Bullrush (*Scirpoides holoschoenus*), sedges **Downstream** ■ **Riparian:** Speckled Alder, Tall White Meadowsweet, Flattop White Aster, Broadleaf Cattail, Sensitive Fern, Canada Goldenrod ■ **Instream:** Dark Green Bulrush, Broadleaf Cattail, Algae, Canada Waterweed (*Elodea canadensis)*	■ Steel grate at inlet possible fish passage impediment by collecting debris and narrowing the channel. Consider clearing/removing grate. ■ Seasonal low flows were a potential impediment to fish passage.	■ None observed in ZDA. ■ Suitable spawning substrate material for Brook Trout was observed in the downstream Zone of General Assessment (ZGA).
12+541 **Notman Township Unnamed Tributary to Little Tomiko River**	■ 02/05/2024	■ Intermittent	■ Warmwater	■ Direct	■ **Upstream:** Detritus, muck, silt ■ **Downstream:** Detritus, muck, silt	■ Upstream: Flats (100%) ■ Downstream Reach 1: Flats (80%), Run (20%) ■ Downstream Reach 2: Run (40%), Pool (60%)	■ **Riparian:** Sedges ■ **Instream:** Broadleaf Cattail	■ Steep gradient observed in the ZGA is likely a permanent impediment to upstream fish movement. ■ Potential seasonal fish passage impediment resulting from low flows.	■ None observed
14+073 **Notman Township Unnamed Tributary to Tomiko River**	■ 15/05/2024 ■ 12/08/2024	■ Permanent	■ Warmwater	■ Direct	■ **Upstream:** no feature present ■ **Downstream:** Muck, Detritus	■ Downstream: Pool (50%), Flats (50%)	**Downstream** ■ **Riparian:** Broadleaf Cattail, Tamarack, Speckled Alder, Flattop White Aster *(Doellingeria umbellata*), Red Raspberry, Reed Canary Grass, Fireweed (*Chamaenerion angustifolium)*, Sensitive Fern, Canada Goldenrod, Black Spruce ■ **Instream:** Broadleaf Cattail, Dark Green Bulrush, Algae	■ Riprap (possible check dam) at culvert inlet potential impediment to fish passage. Consider removing riprap. ■ Low flow through the culvert potential seasonal impediment to fish passage.	■ None observed

Waterbody	Date (dd/mm/yyyy)	Flow	Thermal Regime	Fish Habitat[1]	Substrate Type[2]	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat
14+408 **Notman Township Unnamed Tributary to Tomiko River**	■ 03/05/2024 ■ 12/08/2024	■ Intermittent	■ Warmwater	■ Direct	■ **Upstream:** Silt, sand, detritus, muck, boulder, clay ■ **Downstream:** Silt, sand, cobble, detritus, muck, bedrock	**Spring** ■ Upstream: Flats (100%) ■ Downstream: Flats (100%) **Summer** ■ Upstream: Dry ■ Downstream: Flats (100%) and partially dry	**Upstream** ■ **Riparian:** Shrubs and Speckled Alder ■ **Instream:** Broadleaf Cattail, algae, bulrush sp. **Downstream** ■ **Riparian:** Bracken Fern, Red Maple, Tamarack, Goldenrod ■ **Instream:** Broadleaf Cattail, Sphagnum Moss (*Sphagnum* sp.), Common Bladderwort, Algae	■ Erosional gullies along highway embankment and deposited material observed in the feature. Habitat could benefit from embankment stabilization. ■ Low flows a likely seasonal impediment to fish passage.	■ None observed
14+926 **Notman Township Unnamed Tributary to Tomiko River**	■ 02/05/2024 ■ 12/08/2024	■ Intermittent	■ Warmwater	■ Direct	■ **Upstream:** Gravel, boulder, sand ■ **Downstream:** Sand, gravel, silt, cobble, bedrock	**Spring** ■ Upstream: Pool (10%), Run (90%). ■ Downstream: Run (90%), Pool (10%). **Summer** ■ Upstream: Dry ■ Downstream: Dry	**Upstream** ■ **Riparian and Instream:** Sedges, Broadleaf Cattail **Downstream** ■ **Riparian and Instream:** Sedges, Broadleaf Cattail	■ Riprap (possible check dam) in ditch a likely impediment to fish passage. ■ Erosional gullies along highway embankment and deposited material observed in the feature. Habitat could benefit from embankment stabilization. ■ Entrance culvert perch likely a permanent impediment to fish passage. ■ Low flows and dry summer conditions are likely seasonal impediments to fish passage. ■ Gradient and low flow (lack of channel) barrier to fish passage at the point where the flow entered the cattail stand in the downstream ZDA.	■ Clean beds of gravel suitable spawning habitat for Brook Trout in downstream ZDA.
16+060 **Notman Township Unnamed Tributary to Elbow Lake (Tomiko River**)	■ 06/05/2024 ■ 13/08/2024	■ Permanent	■ Warmwater (MNR 2024b)	■ Direct	■ **Upstream**: Muck, detritus, silt, boulder ■ **Downstream**: Sand, silt, detritus, boulder, clay	**Spring and Summer** ■ Upstream: Pond (100%) ■ Downstream: Run (100%)	**Upstream** ■ **Riparian:** Eastern White Cedar, Balsam Fir, Speckled Alder, Sweet Gale ■ **Instream:** Water Smartweed, Arrowhead, Softstem Bulrush, Water Arrum (*Calla palustris***)**, Elodea spp. **Downstream** ■ **Riparian:** Broadleaf Cattail, Spotted Joe Pyeweed, Jewelweed, Goldenrod, Canada Mint *(Mentha canadaensis*), Sensitive Fern, Speckled Alder. ■ **Instream:** Broadleaf Cattail	■ Buried culvert (or lack of water crossing structure) and accumulated debris are likely an impediment to fish passage. ■ Erosional gullies along highway embankment and deposited material observed in the feature. Habitat could benefit from embankment stabilization.	■ None observed
16+278 **Notman Township Unnamed Tributary to Tomiko Lake (Tomiko River)**	■ 07/05/2024 ■ 13/08/2024	■ Permanent	■ Warmwater	■ Direct	■ Upstream: Detritus, muck, sand, silt ■ Downstream: Gravel, cobble, sand, silt, detritus	**Spring** ■ Upstream: Pool (100%) ■ Downstream: Run (70%), Riffle (30%) **Summer** ■ Upstream: Pool (100%) ■ Downstream: Flats (100%)	**Upstream** ■ **Riparian:** Speckled Alder, Sensitive Ferns, Black Spruce, Balsam Fir, Canada Mint, Field Strawberry ■ **Instream:** Sphagnum Moss, Algae **Downstream** ■ **Riparian:** Speckled Alder, Red Maple, Balsam Fir, Black Spruce, Skunk Current (*Ribes glandulosum*), Mountain Maple, Marsh Fern, White Birch, Sensitive Fern, Black Spruce, Canada Mint, Field Strawberry Instream: Sphagnum Moss	■ Embankment erosion and deposited embankment material observed in the feature. Consider stabilizing embankment. ■ Buried culvert impeding flow and fish passage. ■ Low flow and accumulated debris at the culvert inlet were likely seasonal impediments to fish passage.	■ None observed

Waterbody	Date (dd/mm/yyyy)	Flow	Thermal Regime	Fish Habitat[1]	Substrate Type[2]	Channel Morphology	Vegetation	Constraints & Opportunities	Significant Fish Habitat
Indirect and Not Fish Habitat									
10+527 Blyth Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Not Fish Habitat					
10+950 Blyth Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Not Fish Habitat					
11+246 Blyth Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Not Fish Habitat					
11+540 Blyth Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Not Fish Habitat					
11+662 Blyth Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Not Fish Habitat					
13+576 Blyth Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Not Fish Habitat					
13+928 Blyth Township	■ 02/05/2024 ■ 07/08/2024	■ Intermittent	■ NA	■ Indirect					
14+359 Blyth Township	■ 30/04/2024 ■ 07/08/2024	■ Intermittent	■ NA	■ Indirect					
16+118 Blyth Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Not Fish Habitat					
16+668 Blyth Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Indirect					
10+072 Notman Township	■ 01/05/2024 ■ 08/08/2024	■ Intermittent	■ NA	■ Indirect					
10+475 Notman Township	■ 15/05/2024	■ Ephemeral	■ NA	■ Not Fish Habitat					
11+430 Notman Township Unnamed Tributary to Little Tomiko River	■ 12/08/2024	■ Intermittent	■ Unknown	■ Not Fish Habitat					
11+976 Notman Township Unnamed Tributary to Little Tomiko River	■ 15/05/2024	■ Ephemeral	■ Unknown	■ Not Fish Habitat					
12+763 Notman Township	■ 15/05/2024	■ Ephemeral	■ Unknown	■ Not Fish Habitat					
13+241 Notman Township	■ 15/05/2024	■ Ephemeral	■ Unknown	■ Not Fish Habitat					
13+680 Notman Township	■ 15/05/2024	■ Ephemeral	■ Unknown	■ Not Fish Habitat					
13+464 Notman Township Unnamed Tributary to Tomiko River	■ 15/05/2024 ■ 12/08/2024	■ Ephemeral	■ Unknown	■ Not Fish Habitat					
14+354 Notman Township	■ 15/05/2024	■ Ephemeral	■ Unknown	■ Not Fish Habitat					

Notes: 1. *Fish habitat is defined in subsection 2(1) of the Fisheries Act to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include but are not limited to spawning grounds and nursery, rearing, food supply and migration areas.*

2. *In general order of dominance*

Table Description:

Waterbody ID	Name of waterbody and Crossing # / Station	**Substrate Type**	Boulder, cobble, rubble, gravel, sand, muck, etc.
Date	Date field investigations occurred (DD/MM/YYYY), as applicable	**Channel Morphology**	E.g. Riffles, runs, pools, undercut banks, etc.
Flow	Ephemeral, Intermittent, Permanent	**Vegetation**	Riparian & In-stream species; emergent, submergent and floating aquatic vegetation
Thermal Regime	Warm, Cool, Cold	**Constraints and Opportunities**	E.g. Perched culvert, eroding bank, fish passage barrier, undersized CSP
Fish Habitat	Direct, Indirect, Not Fish Habitat	**Significant Fish Habitat**	E.g. specialized habitat that supports critical life functions, areas contributing to fisheries productivity, etc.

3.3 Fish Community

Table 3 below includes a summary of fish sampling results from field investigations and a summary of the fish communities expected to inhabit the watercourses based on background information and site investigations.

In-water work timing windows are determined by the MNR and are based on the spawning and early development periods of fish that occur in the identified watercourses. Limited fish community data was available for the watercourses in the Study Area, including through correspondence with MNR. As such, MNR have not provided in-water work timing windows for construction and have indicated that timing windows are to be informed by the results of this assessment. The timing windows determined according to the *In-water Work Timing Window Guidelines* (MNR, 2013) are included in **Tables 3** and **4.** These will be provided to MNR for confirmation.

Table 3: Existing Fish Community Summary Table (Template D2B)

Waterbody ID	Date	Fish Species Present	Year Class(es)	Species at Risk Present	In-water Work Timing Restriction*
15+975/16+035 **Merrick Township** **Little Sturgeon River**	06/08/2024	**MNR:** Brook Trout (*Salvelinus fontinalis*) (MNR, 2024b) **AECOM 2024 Survey**: Brook Trout, Northern Pearl Dace (*Margariscus nachtriebi)*, Golden Shiner (*Notemigonus crysoleucas)*, Northern Redbelly Dace (*Chrosomus eos)*, White Sucker (*Catostomus commersonii)*	Juvenile, Adult	No	September 1- June 15
12+725 **Blyth Township** **Unnamed Tributary to Little Sturgeon River**	06/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey:** Central Mudminnow (*Umbra limi)*, Brook Stickleback (*Culaea inconstans)*	Adult	No	April 1- June 15
13+400 **Blyth Township** **Unnamed Tributary to Little Sturgeon River**	06/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey:** Central Mudminnow, White Sucker, Brook Stickleback	Juvenile, Adult	No	April 1- June 15
15+512 **Blyth Township** **Unnamed Tributary to Tomiko River**	08/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey:** Central Mudminnow, Brook Stickleback	Adult	No	April 1- June 15
10+881 **Notman Township** **Unnamed Tributary to Little Tomiko River**	09/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey:** Brown Bullhead (*Ameiurus nebulosus)*, Central Mudminnow, White Sucker, *Leuciscidae* spp., Brook Stickleback, Golden Shiner, Northern Redbelly Dace, *Chrosomus* spp., Creek Chub (*Semotilus atromaculatus)*	Juvenile, Adult, YOY	No	April 1- June 15
11+800 **Notman Township** **Unnamed Tributary to Little Tomiko**	12/08/2024 19/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey:** Central Mudminnow, Brook Stickleback, Northern Redbelly Dace, White Sucker, Creek Chub	Juvenile, Adult	No	April 1- June 15
12+541 Notman Township Unnamed Tributary to Little Tomiko River	N/A	**MNR: No fish community data available** **AECOM 2024 survey: Not fished**	N/A	No	April 1- June 15
14+073 **Notman Township** **Unnamed Tributary to Tomiko River**	12/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey:** Brook Stickleback	Adult	No	April 1- June 15
14+408 **Notman township** **Unnamed Tributary to Tomiko River**	12/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey**: None captured	N/A	No	April 1- June 15
14+926 **Notman Township** **Unnamed Tributary to Tomiko River**	N/A	**MNR: No fish community data available** **AECOM 2024 Survey: Not fished**	N/A	No	April 1- June 15
16+060 **Notman Township** **Unnamed Tributary to Elbow Lake (Tomiko River)**	12/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey:** Northern Pearl Dace, Northern Redbelly Dace, Finescale x Northern Redbelly Dace (*Chrosomus neogaeus x Chrosomus eos),* Creek Chub, Brook Stickleback, Central Mudminnow	Juvenile, Adult	No	April 1- June 15
16+278 **Notman Township** **Unnamed Tributary to Elbow Lake (Tomiko River)**	13/08/2024	**MNR: No fish community data available** **AECOM 2024 Survey:** Central Mudminnow	Juvenile	No	April 1- June 15

*Note: * When work below the high water mark, including within isolated work areas, is prohibited without explicit agency approval.*

4. General Assessment of Potential Impacts

4.1 Description of Proposed Works

The reconfiguration of Highway 11 to accommodate the 2+1 model will require various works and activities, details of which are not yet confirmed. At this stage of the design, anticipated project-related activities in or near water include:

- Highway widening;
- Highway realignment;
- Drainage improvements and ditching;
- Blasting;
- Repair, replacement, and/or extension of existing water crossings, and;
- Construction of new water crossings and wildlife passages.

This preliminary assessment of the potential impacts, and application of the Protocol and notification / review requirements are subject to change pending more detailed assessments of the proposed work as the design progresses. A detailed assessment of the proposed work, the potential impacts of the Project, application of MTO Best Management Practices (BMPs), notification or review requirements, and mitigation measures will be evaluated further in the Fish and Fish Habitat Impact Assessment Report.

During the subsequent impact assessment for this project, the *MTO Best Management Practices Manual* (BMP Manual) (MTO, 2020c) will be reviewed for application of appropriate BMPs to the scope of work. Where BMPs do not apply, applicable mitigation measures and Ontario Provincial Specifications and Standards (OPSS) outlined in these BMPs should be implemented where possible, and the assessment will need to proceed to Step 4 of the Protocol where it will be determined whether the risk of death of fish or HADD to fish habitat will be avoided or mitigated. In addition, a review of requirements of the Project by the DFO Fish and Fish Habitat Protection Program (FFHPP) will be determined at this later stage.

Table 4 highlights the constraints and design considerations to be provided to the Design Team. The means of and feasibility for implementation as noted in Column 3 is subject to revisions as the detailed design process advances. Without the implementation, monitoring for effectiveness, replacement, and repair (as needed) of applicable mitigation measures, activities associated with the proposed work in or near waterbodies and fish habitat have the potential to contravene the *Fisheries Act, 1985* by:

- Introducing deleterious substances into waterbodies (e.g., sediment, grease, fuel, oil, concrete, concrete wash, solvents, etc.);
- Increased erosion potential;
- Removing / altering in-water or overhanging structure and cover, by altering riparian habitat and vegetation, in-water woody debris, substrate or vegetation;
- Altering habitat features important for fish functions, such as watercourse realignment, infilling or encroaching of highway footprint in water;
- Blasting in or near water;
- Alterations of flows and drainage inputs;
- Creation of fish passage barriers;
- Operating machinery in water or on banks; and/or,
- Placing permanent or temporary material or structures in water.

It is anticipated that where feasible and practical, the proposed projects works and water crossing structures will be designed and constructed in a manner that can meet the criteria of the applicable BMP and can apply the mitigation measures and OPSS stipulated therein. Proper implementation of these BMPs can avoid or mitigate the risks of death of fish or HADD to fish habitat and should allow for the proposed works to avoid the need for DFO submission through a Request for Review.

It is anticipated that MTO BMPs are not likely to apply to all aspects of the Project, which will include highway realignment and widening that results in encroachment in fish habitat, infilling or increased footprint, culvert extension or liners, to name a few. Where MTO BMPs cannot be applied, further assessment, i.e., Step 4 of the Protocol and the Pathways of Effects (PoE) process will be required to determine the likelihood of a HADD or death of fish. Where it is found through Step 4 assessment that residual, negative impacts resulting in HADD or death of fish cannot be avoided or mitigated, submission of a Request for Review to DFO to review and confirm the need for Authorization under the *Fisheries Act*, 1985 will be required.

Consideration and implementation where feasible of the location-specific design considerations and constraints described below in **Table 4** minimizes (but may not negate, pending design) the risk of HADD or death of fish. The preliminary general mitigation measures outlined in **Section 4.1.1** should also be implemented into the design and contract documents in conjunction with the design considerations, where possible. At a Project level, there are numerous constraints that may prevent implementation of all applicable recommended measures and considerations. Where feasible, general design considerations to be considered and across the Project and into the subsequent detail design plans and work plans for work in or near fish habitat include:

- Design and install culverts to prevent the creation of barriers to fish movement and maintain bankfull channel functions and habitat functions to the extent possible. Where permanent in-water structures are placed in fish habitat, naturalize these areas by restoring streambed and bank conditions, implementing applicable OPSS (e.g., OPSS 182, 825, and 1005).
- Where feasible, design new culverts or culvert extensions to be as short as possible to reduce the footprint of permanent alteration in fish habitat. Installing wingwalls can help reduce the overall length of culverts in some situations.
- Where new watercourse crossings are proposed, design preference should be given first to clear-span bridges, second to open-bottom culverts, and third to closed-bottom culverts.
- Avoid or minimize as much as possible highway widening, realignment, or encroachment into lakes, rivers, and wetland.
- Minimize blasting where feasible in or near fish habitat.

4.1.1 General Mitigations

General mitigation measures that will likely apply and should be considered in the detail design, work plans, and contract preparation for work in or within 30 m of fish-bearing waterbodies include:

Operational Constraints

- Access to waterbodies and banks should be limited to protect riparian vegetation and to minimize bank disturbance; and
- In-water work below the High Water Mark (HWM) and work on watercourse banks should be carried out during the appropriate in-water timing window as per **Table 4**.

Management Practices and Controls

- An Erosion and Sediment Control (ESC) Plan should be designed and implemented to contain/isolate exposed soils, stockpiled materials, and unstable areas in the work zone and to prevent the release of sediment to all waterbodies. The work site should be stabilized prior to removal of ESC measures following construction (as per OPSS 804 and 805). Site-specific ESC plans should be developed for each watercourse where work is proposed within 30 metres of a watercourse;
- Design and implement an in-water work area isolation plan to maintain clean flow around the work area at all watercourse locations where in-water work is proposed (as per OPSS 804, 805, and 517). The design should:
  - Use only clean materials free of particle matter for temporary cofferdams.
  - Manage flow withdrawal and discharge to prevent erosion and the release of sediment to a waterbody.
  - Ensure work zones are stabilized against high flows at the end of each workday.
  - Design and install in-stream cover to replace or re-instate fish cover removed, altered or disturbed during construction.
  - Design and install culverts to prevent the creation of barriers to fish movement, maintain bankfull channel functions and habitat functions, and remediate existing barriers to fish movement to the extent possible.
  - Where new watercourse crossings are proposed, design preference should be given first to clear-span bridges, second to open-bottom culverts, and third to closed-bottom culverts where possible.
  - As per OPSS 182, any fish isolated in the work area should be transferred (using appropriate capture, handling, and release techniques to prevent harm and minimize stress) downstream or away from the construction area. Should fish relocation be required to support proposed in-water works, a Licence to Collect Fish for Scientific Purposes from MNR will be required. Fish screens shall be used to avoid entrainment of fish in pumps or hoses.
  - Design and implement a work area containment plan to isolate all above-water work to prevent the release of sediment or other contaminants to a waterbody (as per OPSS 517). The contract requirements should include regular inspection, repair, removal, and disposal of isolation measures and materials. Work zones should be clearly delineated prior to works to avoid the unintentional intrusions into nearby natural areas.
  - Where possible, organic material barriers (i.e., fibre roll barrier, sediment log, coir rolls, etc.) should be used in the drainage ditches to mitigate sediment transport.
  - Materials used or generated during construction (i.e., organics, soil, woody debris, temporary stockpiles, construction debris, etc.) should be stored and managed in a way that prevents the release of these materials to a waterbody. This shall include storing materials a safe distance from a waterbody (i.e., greater than 30 metres from any watercourse) and/or isolation measures (as per OPSS 182).
  - Dewatering operations should be managed to prevent erosion or the release of sediment-laden water to a waterbody (as per OPSS 804 and 805).
  - A Spills Management Plan should be prepared and include materials, instructions, education, and emergency numbers. The plan should be kept onsite at all times, communicated to work crews, and be properly implemented in the event of accidental spills (Spill Prevention and Response Contingency Plan as per OPSS 182).

- Operate, store, and maintain equipment and associated materials in a manner and at a distance that prevents the entry of any deleterious substance from entering a waterbody (as per OPSS 182). Any part of equipment entering the waterbody or operating from the bank shall be cleaned, free of fluid leaks, and in good working condition.
- Where blasting in or near fish habitat cannot be avoided, the measures, charge weights, and setback buffers stipulated in the *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters* (Wright and Hopky, 1998) should be implemented.

Rehabilitation

- Re-stabilize or re-store the beds of waterbodies disturbed during construction to pre-construction conditions or better (as per OPSS 182, 804, and OPSS 1005).
- Re-stabilize the banks of a waterbody that have been disturbed during construction to pre-construction conditions or better (as per OPSS 182 and OPSS 803) including riparian vegetation or stone material, temporary measures, and the avoidance of hard engineering.
- Re-stabilize and re-vegetate soils exposed or disturbed during construction, including new or cleaned-out ditches (as per OPSS 182).

Monitoring

- A monitoring program for in or near-water work should be developed for the proper implementation, function, maintenance, and repair of mitigation measures (as per OPSS 182).

Table 4 highlights the constraints and design considerations to be provided to the Design Team for GWP 5151-21-00.

Table 4: Design Considerations Table for GWP 5151-21-00

<table>
<tr><th>Factors to Consider</th><th>Design Considerations Provided by the Fisheries Assessment Specialist</th><th>Describe How Each Factor Was Addressed Through Design</th></tr>
<tr><td>In-water Works Timing Window</td><td>
■ In-water work timing windows are determined by the Ontario Ministry of Natural Resources (MNR) and are based on the spawning and early development periods of fish that occur in the watercourse in question. Limited fish community data was available for the watercourses in the Study Area, including through correspondence with MNR. As such, MNR have not provided in-water work timing windows for construction and have indicated that timing windows are to be informed by the results of this assessment. The timing windows stipulated below were determined according to the In-water Work Timing Window Guidelines (MNR, 2013) and in consideration of the fish community data retrieved from background and field investigations, and thermal regime. MNR will also be consulted for confirmation of these timing windows.
■ In-water work isolation measures (i.e., coffer dams) required for in-water work should not be in place outside of the in-water work timing window. Work within isolated, dewatered work areas is not considered to be work outside of the high water mark, and should abide by the timing window.
■ The timing window (i.e., where works can occur below the high water mark) for each assessed waterbody location and connected habitat (i.e., waterbodies in the Study Area connected upstream or downstream to these locations) are:
<table>
<tr><td colspan="3">June 16 – March 31: When work can occur, for the protection of spring-spawning species</td></tr>
<tr><td>12+725 Blyth Township
Unnamed Tributary to Little Sturgeon River</td><td>13+400 Blyth Township
Unnamed Tributary to Little Sturgeon River</td><td>15+512 Blyth Township
Unnamed Tributary to Tomiko River</td></tr>
<tr><td>12+541 Notman Township
Unnamed Tributary to Little Tomiko River</td><td>10+881 Notman Township
Unnamed Tributary to Little Tomiko River</td><td>11+800 Notman Township
Unnamed Tributary to Little Tomiko River</td></tr>
<tr><td>14+073 Notman Township
Unnamed Tributary to Tomiko River</td><td>14+408 Notman Township
Unnamed Tributary to Tomiko River</td><td>14+926 Notman Township
Unnamed Tributary to Tomiko River</td></tr>
<tr><td>16+060 Notman Township
Unnamed Tributary to Elbow Lake (Tomiko River)</td><td>16+278 Notman Township
Unnamed Tributary to Elbow Lake (Tomiko River)</td><td></td></tr>
</table>
<table>
<tr><td>June 16 – August 31: When work can occur, for the protection of spring and fall-spawning species</td></tr>
<tr><td>15+975/ 16+035 Merrick Township - Little Sturgeon River</td></tr>
</table>
</td><td>■ To be determined and addressed at the impact assessment phase and report for the Project, according to the MTO Environmental Guide for Fisheries (the Guide, MTO 2020a).</td></tr>
<tr><td>Fish Passage</td><td>
■ In-water work isolation measures (i.e., cofferdams) required for in-water works should not be in place outside of the in-water work timing window.
■ Field studies identified both natural and man-made, seasonal and permanent impediments to fish passage at multiple locations in the Study Area. Pending the nature of the impediment, in some instances there may be opportunity to incorporate into the work plan measures to reinstate or improve fish passage. The locations where fish passage impediments were identified are listed below, as well as a brief description of the impediment and whether or not opportunity to reinstate or improve fish passage is anticipated.
- 15+975/16+035 Merrick Township: Beaver dam downstream of Highway 11 may be seasonal impediment fish passage. Natural beaver dam outside of ROW, not recommended for further consideration.
- 12+725 Blyth Township: Boulders at culvert inlet likely impediment to fish passage, particularly during low flow. Removal of boulders should be considered.
- 13+400 Blyth Township: 1) Boulders and debris accumulated at culvert inlet was likely impediment to flow and fish passage. Removal of boulder and debris should be considered. 2) Beaver dam downstream of culvert outlet may impede fish passage. Natural beaver dam outside of ROW, not recommended for further consideration. 3) Natural, seasonal low flow impediment, particularly in culvert. Natural flow condition, but if feasible and pending the proposed work at this location, design could consider incorporating refuge pool(s) at the culvert inlet and/or outlet, or low flow channel if applicable. 4) The existing culvert gradient and water velocity observed during field investigations likely impeded fish passage. Pending the proposed work at this location (i.e., culvert replacement) measures to address culvert gradient, embed culvert, reduce culvert velocity, etc. should be considered.
- 15+512 Blyth Township: Rock and woody debris jam at the culvert inlet was likely impediment to flow and fish passage. Removal of boulder and debris should be considered.
- 11+800 Notman Township: Steel grate at inlet and debris accumulated at the gate were likely impediments to fish passage. Removal of the grate and debris should be considered.
- 14+073 Notman Township: Riprap (possible remnants of rock check dam) at culvert inlet was likely impediment to fish passage. Removal of riprap/check dam should be considered.
- 14+408 Notman Township: Natural, seasonal low flow impediment, particularly in culvert. Natural flow condition, but if feasible and pending the proposed work at this location, design could consider incorporating refuge pool(s) at the culvert inlet and/or outlet, or low flow channel if applicable.
- 14+926 Notman Township: 1) Perched entrance culvert was likely impediment to fish passage. Pending the proposed work at this location (i.e., entrance culvert replacement), consider measures (i.e., embed) culvert to reinstate fish passage. 2) Natural gradient downstream of Highway 11 where channel and flow dissipate down natural grade to cattail wetland was likely impediment to fish passage. Natural gradient and landscape condition, not recommended for further consideration. 3) Natural, seasonal low flow impediment. Natural flow condition but if feasible and pending the proposed work at this location, design could consider incorporating refuge pool(s) at the culvert inlet and/or outlet, or low flow channel if applicable. 4) Riprap (possible remnants of rock check dam) at culvert inlet was likely impediment to fish passage. Removal of riprap/check dam should be considered.
- 16+060 Notman Township: Buried culvert and debris at outlet were likely impediments to fish passage. Boulder and debris should be removed.
- 16+278 Notman Township: Buried culvert and debris at outlet were likely impediments to fish passage. Boulder and debris should be removed.
</td><td>○</td></tr>
</table>

Factors to Consider	Design Considerations Provided by the Fisheries Assessment Specialist	Describe How Each Factor Was Addressed Through Design
Significant Fish Habitat	■ No aquatic Species at Risk are known to occur in or near the Study Area. ■ Potential significant fish habitat and features were observed at the locations listed below. The function of the habitat (where applicable) has not been confirmed through targeted surveys (i.e., spawning surveys, etc.). The function of the suitable habitat noted below is also pending species presence in the waterbody and access to the identified suitable habitat. - **15+975/16+035 Merrick Township:** 1) Juvenile Brook Trout (*Salvelinus fontinalis*) captured during summer assessment, and beds of clean gravel suitable for Brook Trout spawning habitat observed within the right-of-way (ROW). Suitable spawning and nursery habitat for Brook Trout were both observed. **2)** Hummocks of narrow-emergent vegetation suitable for Northern Pike (*Esox lucius*) spawning habitat were present in the finger channels and flooded pockets between the main channel at 15+975, and side channel at 16+035, in the Zone of detailed Assessment (ZDA) upstream and downstream of Highway 11. - **13+400 Blyth Township:** Groundwater indicator observed on the wetland shoreline downstream of the culvert. - **15+512 Blyth Township:** Groundwater indicator (iron staining) on rocks near inlet and outlet of culvert in the ROW. - **10+881 Notman Township:** Suitable spawning habitat for Northern Pike in narrow-emergent and riparian vegetation, on the north bank in the downstream ZDA of Highway 11. - **11+800 Notman Township:** Suitable spawning substrate material for Brook Trout was observed, outside of the ZDA (> 50 m downstream of Highway 11). - **14+926 Notman Township:** Clean beds of gravel suitable for Brook Trout spawning habitat observed in the downstream ZDA and ROW.	
Constraints and Opportunities	■ Throughout the Study Area, garbage and debris were observed along the highway embankment, and in many cases in the immediate vicinity or within watercourses. Habitat would benefit from garbage cleanup. ■ Erosion rills and gullies were observed throughout the Study Area. More specifically, embankment erosion was observed near several of the assessed watercourses, and in some cases, what appeared to be embankment material was observed deposited on watercourse beds and washed downstream. Measures to stabilize highway embankments should be considered throughout. Specific locations near a waterbody where this was observed included: - Merrick Township: 15+975/16+035 (Erosion along Highway 11 embankment, erosion and sink hole at Stewart Hammel Road) - Blyth Township: 15+512 - Notman Township: 14+408, 14+926, 16+060, 16+278 ■ In addition to general garbage and debris cleanup throughout the Study Area, specifically at 15+975/16+035 Merrick Township, spill cleanup and containment measures (containment boom, tarps, etc.) were observed in and adjacent to the watercourse and highway ROW. These were observed during both the spring and summer assessments. It is unknown whether the spill management measures were functional for continued spill management or abandoned. If these measures were abandoned, they should be removed. ■ 15+512 Blyth Township: Discarded asphalt and culvert were observed in the ROW. Discarded highway material should be removed. ■ 15+975 Merrick Township at Steward Hammel Road: The twin culverts at Steward Hammel Road were fully submerged, and scour was noted at the culvert embankment in addition to the sink hole observed. The twin culverts were also substantially smaller than the open foot arch culvert at Highway 11. Depending on the nature of the proposed work at Steward Hammel Road, if any, culvert size should be examined to facilitate sufficient drainage to minimize erosion, scour, and washout.	
Other Considerations	■ Where possible, design should avoid highway widening or realignment into waterbodies. Where Project design will result in loss of fish habitat resulting from infilling, including below the high water mark as well as riparian areas, the risk of the Harmful Alteration, Disruption, or Destruction (HADD) of fish habitat in contravention of the *Fisheries Act*, 1985 is high. Projects resulting in HADD require Authorization under the *Fisheries Act*, 1985. This process, should it be required, would extend permit scheduling and would require additional supporting submissions for Fisheries and Oceans Canada (DFO) review and approval, such as habitat offsetting plan, additional Indigenous consultation, etc.	

5. Potential Enhancement / Offsetting Measures

Opportunities to improve the existing fish habitat conditions or correct impairments to fish habitat were documented during the field investigations carried out in 2024. Those opportunities that may be are reasonably feasible to be implemented into the Project are listed in **Table 4** and are further discussed below.

Impediments to fish passage were identified at several locations. In some instances, these impediments were found to be a result of the natural topography of the surrounding landscape and stream gradient or related to natural processes such as seasonal low flows and beaver activity. However, fish passage issues were noted at some locations that were attributed to anthropogenic structures, fallen trees, or debris that could conceivably be remedied as part of the Project works. If works are proposed at: 12+725 Blyth Township, 13+400 Blyth Township, 15+512 Blyth Township, 11+800 Notman Township, 14+073 Notman Township, 14+926 Notman Township, 16+060 Notman Township, and 16+278 Notman Township, removal of such material that impedes fish passage should be considered. At culverts where the impediments identified would require more substantial measures to remediate passage issues (i.e., grade or perch correction), such measures should be taken into account during the design depending on the nature of the work that is proposed. These could include those culverts proposed for extension, rehabilitation, or replacement. These locations include 13+400 Blyth Township, and 14+926 Notman Township (entrance culvert).

Rills and gullies were observed along the highway embankment in multiple locations, and in some instances, what appeared to be embankment material was observed in watercourses that had been deposited on the streambeds and/or transported downstream. Those locations where this was observed at or near fish-bearing waterbodies are listed in **Table 4** and shown in **Figure 2** in **Appendix A**. Measures to stabilize embankments throughout the Project area, but in particular those areas near fish habitat, should be explored to prevent further erosion of embankment material into watercourses or other adjacent natural features.

Throughout the assessed Study Area, multiple intermittent and low-flow conditions were observed in watercourse features. Low flows and intermittent systems are impediments to fish passage that can leave fish stranded in channels that are no longer connected to a larger system. At 13+400 Blyth Township and 14+926 Notman Township (see **Table 4**), the low flow conditions were observed throughout most, if not all, of the ZDA of the watercourses and was not limited to within the culvert and is therefore a natural occurrence throughout that is not likely feasible to alter. However, in such conditions, refuge pools are often used by fish to survive until water levels rise and/or a rain event occurs that allows them to seek out more permanent habitat. If work is proposed at any of these locations, either at the culvert inlet/outlet or within the channel itself, design could consider retention of any existing pool features. Otherwise, design could consider the creation of refuge pools at culvert inlets and outlets, or low flow channels in box or open foot culverts, paired with inlet and outlet refuge pools.

Beaver dams were identified at several locations in **Tables 2** and **4**. Though not likely to be a complete barrier, they may impede fish passage. Beaver dam removal could be considered to improve fish passage; however, all observations of beaver dams were outside of the ROW. Furthermore, beaver dams are a natural occurrence that in other ways enhance habitat, and if the dams are active and unless the beavers are eliminated, they typically reconstruct dams in short order. For these reasons beaver dam removal is not recommended as a priority for fish habitat enhancement measures.

Garbage and debris cleanup was also recommended throughout the Study Area. This refers to general trash and litter removal in and adjacent to the ROW. Additional possible debris removal was identified at 15+975/16+035 in Merrick Township. Spill containment and cleanup measures were observed in the watercourse and banks during both the spring and summer assessments. It was not confirmed whether these measures were functional over the

course of the spring and summer or were abandoned. It is likely the measures were retained in place as they continued to address the spill at that location. However, if these measures have been abandoned, they should be removed and should be prioritized for early works. At 15+512 Blyth Township, discarded asphalt and culvert were observed in the ROW, presumed to be discarded on site following previous culvert replacement work. These discarded materials should be removed.

The Impact Assessment phase of the fisheries assessment and co-ordination with the design team will identify the potential for the Project to contravene the *Fisheries Act*, 1985 by causing the death of fish or HADD. Such activities require Authorization by DFO under the *Fisheries Act*, 1985 to complete these works, which in turn are contingent on an approved plan to offset the harm caused by the project. It is anticipated considering the scope of the Project that there is the likelihood of Authorization required for widening and/or realignment work where it is not likely the negative residual impacts and HADD can be fully mitigated or avoided. Other than the enhancement measure described above, potential offsetting opportunities could include the creation or enhancement of spawning or nursery habitat in the Tomiko or Little Sturgeon watershed such as construction of embayment areas with plantings to target Northern Pike for spawning and nursery habitat or placement of riverstone to create suitable habitat for Walleye spawning, or watercourses such as the unnamed tributary to the Little Sturgeon River at 15+597/16+035 in Merrick Township where bank erosion outside of the ROW was observed. Bank stabilization and enhancement measures could be considered to enhance riparian cover and instream structure, as well as to reduce erosion. The offsetting plan will be developed only if required with the issuance of an Authorization, in consideration of the extent and intensity of the authorized HADD, and in consultation with DFO.

6. Summary

The Study Area for the southern portion of the Project; GWP 5151-21-00 Highway 11 from Sand Dam Road northerly for 13.8 km to Ellesmere Road; was assessed through background data review, agency correspondence, and field investigations in accordance with the Guide. This assessment describes in detail the existing conditions of the fish and fish habitat at 12 waterbodies where they intersected with the current alignment of Highway 11. This assessment characterizes the waterbodies throughout the Project Study Area and will inform the Impact Assessment of the Project, Environmental Assessment, public and Indigenous consultation, and the Design Team. This assessment also at a preliminary level discusses the potential impacts of the Project. The Impact Assessment to be completed later in the design phase and will be informed by more specific design details will recommend site-specific mitigations, BMPs and OPSS, and avoidance measures, confirm the likelihood for the Project to result in the death of fish or HADD to fish habitat, and the regulatory review and authorization requirements for compliance with the Protocol, the *Fisheries Act 1985*, the SARA, and the ESA (if applicable).

Of the 31 potential waterbody locations surveyed, 12 were found to be direct fish habitat and were assessed in detail to provide a comprehensive account of the fish habitat and fish community of those waterbodies in accordance with the Guide. At these 12 waterbodies, important habitat features and potential Project opportunities and constraints were identified. These are described in detail and summarized in **Section 3.2** and in **Table 4** in **Section 4.1.1**, and include:

- Brook Trout were confirmed in the Little Sturgeon River, at 15+975/16+035 Merrick Township.
  - Due to the limited amount of existing fisheries information for the Study Area, the MNR have indicated that in-water work timing windows shall be determined based on the results of Project field studies. Timing windows were determined using this information and following the *In-water Work Timing Window Guidelines* (MNR, 2013). These will be confirmed with MNR.
  - At 15+975/16+035 where fall-spawning species were confirmed, the in-water work timing restriction (when work below the high water mark is prohibited) is from September 1 – June 15.
  - At the remaining 11 waterbodies, the in-water work timing restriction is from April 1 – June 15.
- Suitable spawning and/or nursery habitat was observed at: 15+975/16+035 Merrick Township, in Notman Township at 10+881, 11+800, and 14+926. The suitable spawning habitat at 11+800 Notman Township was more than 50 m downstream of Highway 11 in the ZGA.
- Natural and anthropogenic, seasonal and permanent impediments to fish passage were identified at several locations. Some of these may present opportunities for correction or enhancement, pending proposed work and design. These include: in Blyth Township at 12+725, 13+400, 15+512. In Notman Township at: 11+800, 12+541, 14+073, 14+408,14+926, 16+060, and 16+278.
- Other opportunities to enhance or remediate existing impacts, such as garbage and debris removal, and highway embankment throughout the Study Area and in particular in areas adjacent to waterbodies to prevent or minimize release of embankment material to natural areas.

7. References

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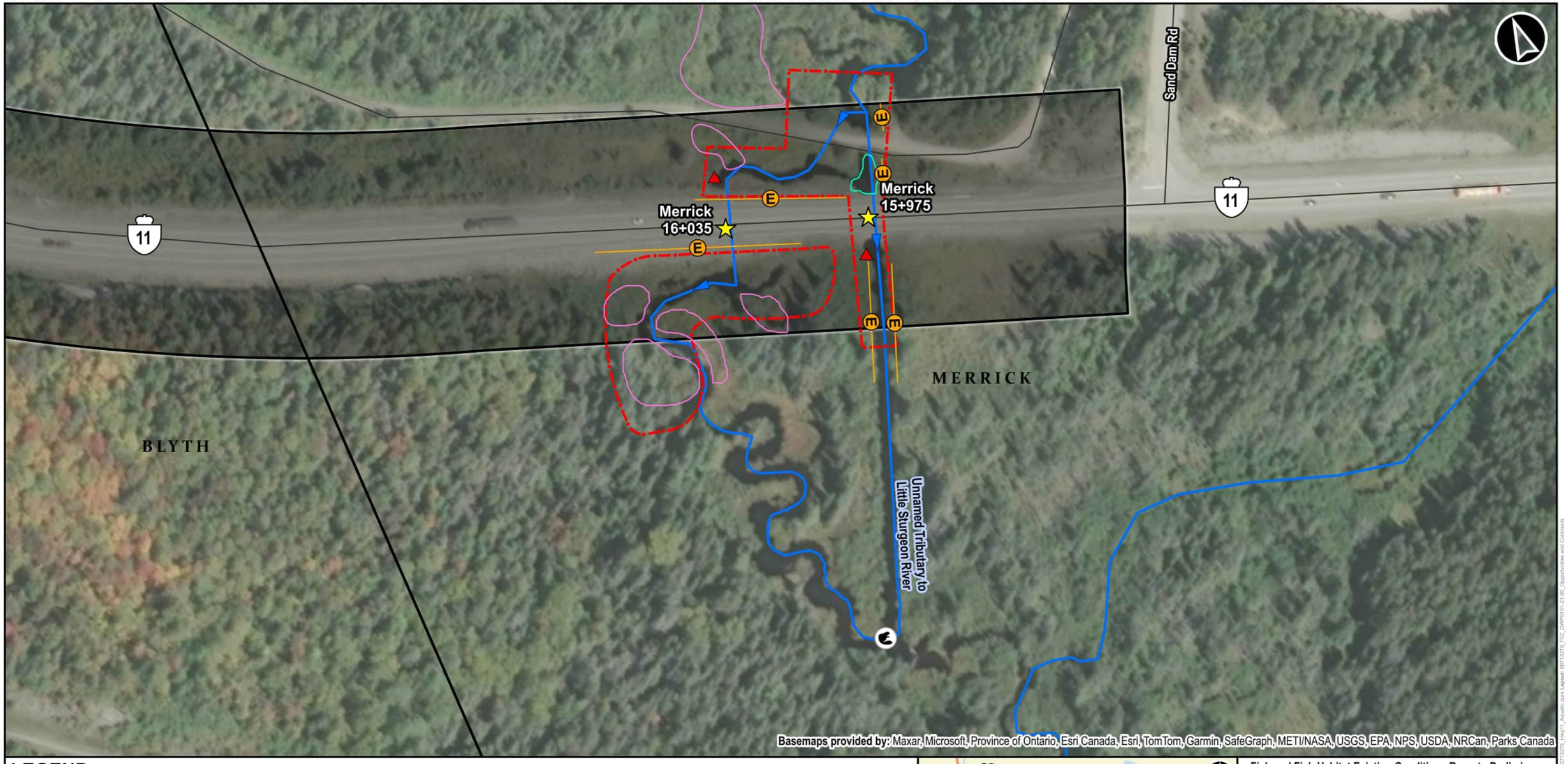
Appendix A

Constraints and Opportunities Map



LEGEND

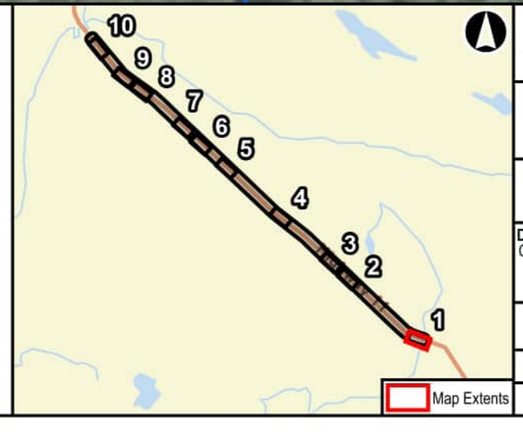
- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Permanent-Cold

Suitable Spawning Habitat

- Northern Pike
- Brook Trout
- Beaver dam
- Spill Containment Measures
- Erosion/Sediment Deposition



Fish and Fish Habitat Existing Conditions Report - Preliminary Design and Class Environmental Assessment (EA) Study for Highway 11 2+1 GWP 5121-21-00

Fish and Fish Habitat Existing Conditions

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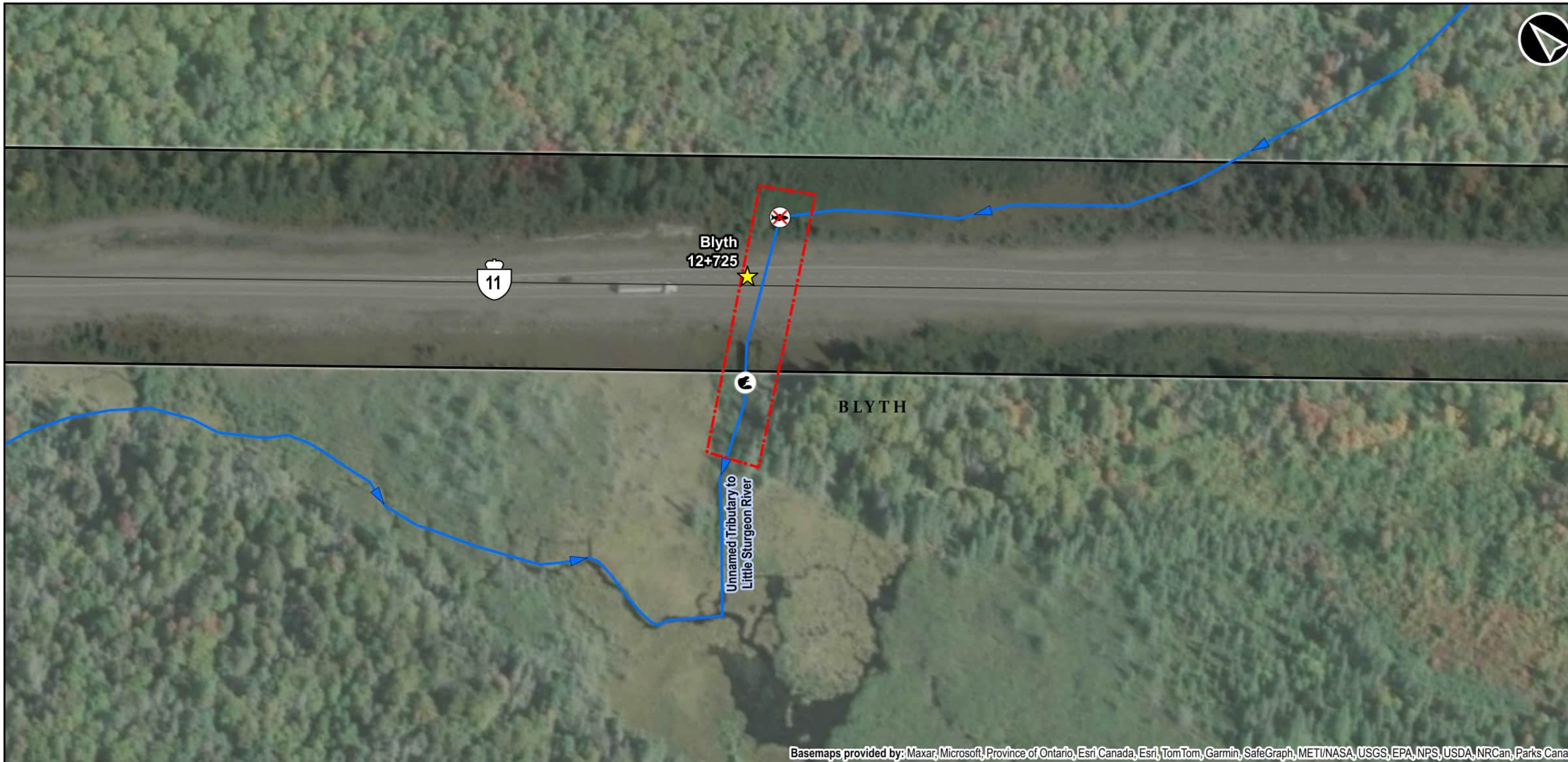
Appendix A-1

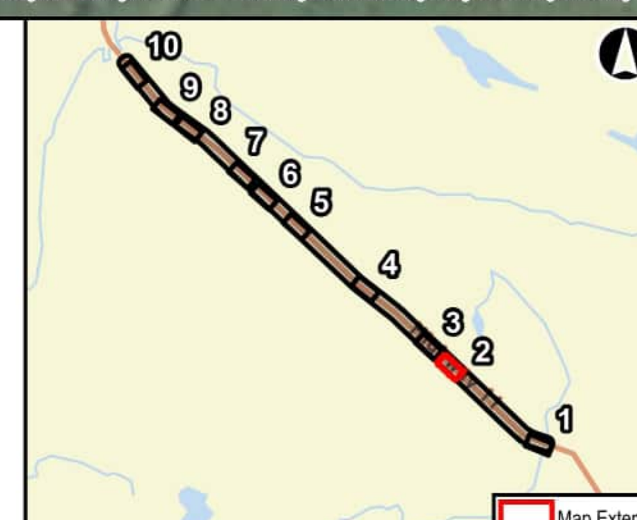


LEGEND

- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Permanent-Cold
- Beaver dam
- Impediment to Fish Passage



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Fish and Fish Habitat Existing Conditions

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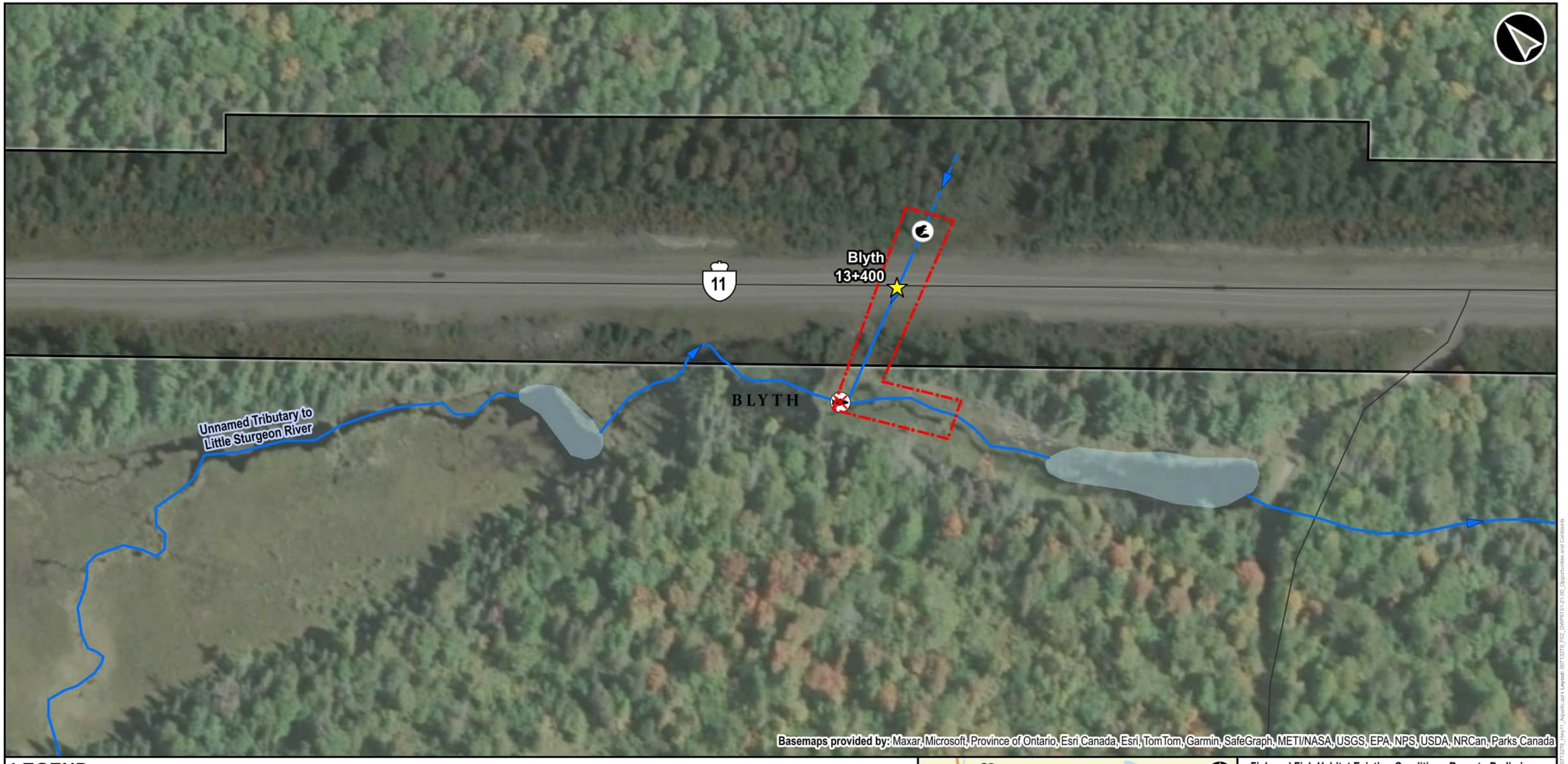
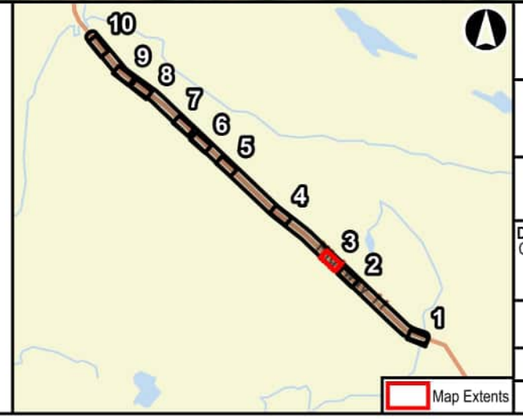


LEGEND

- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Permanent-Cold
- Intermittent-Cold
- Beaver dam
- Impediment to Fish Passage



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Fish and Fish Habitat Existing Conditions

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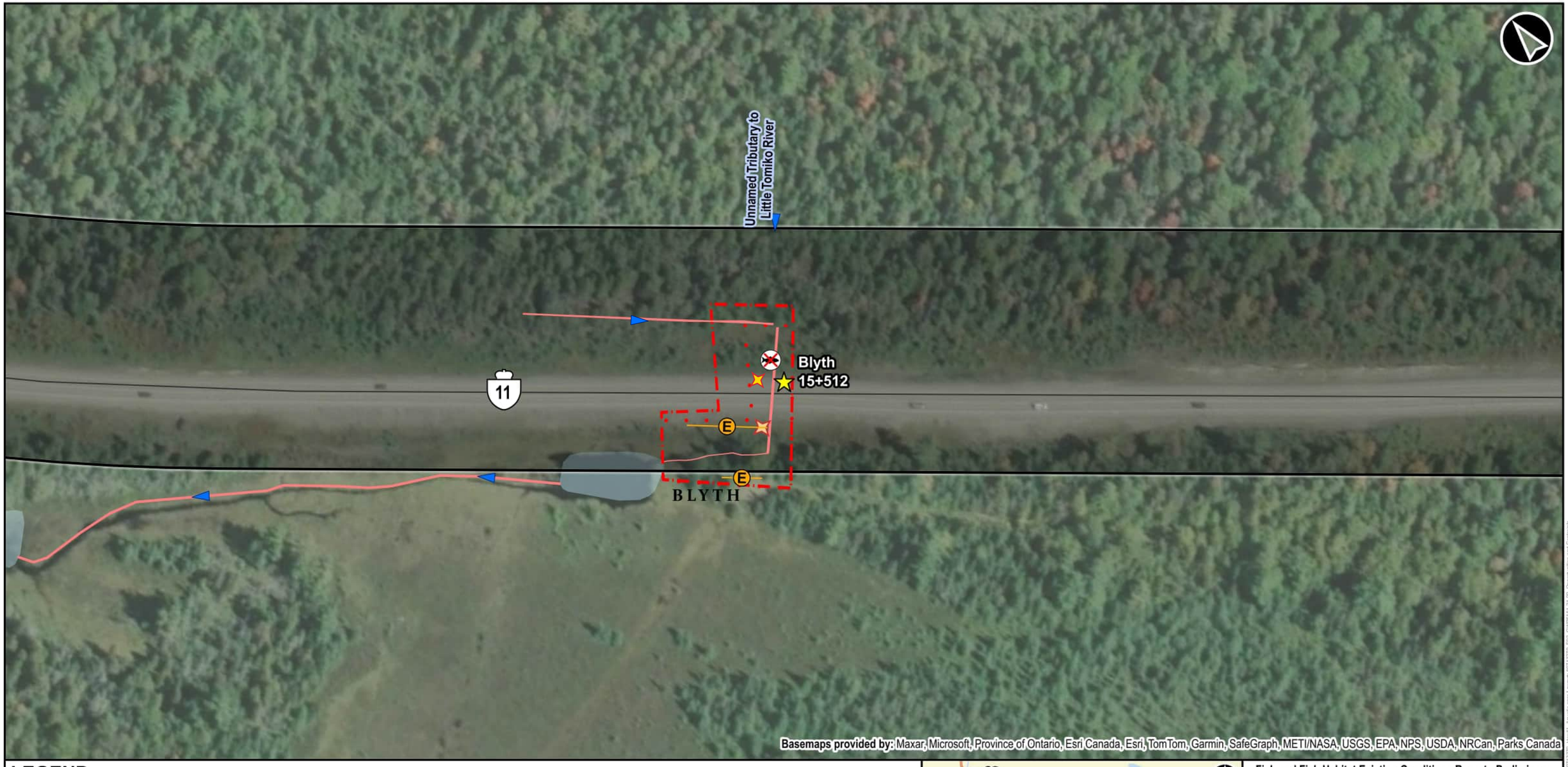


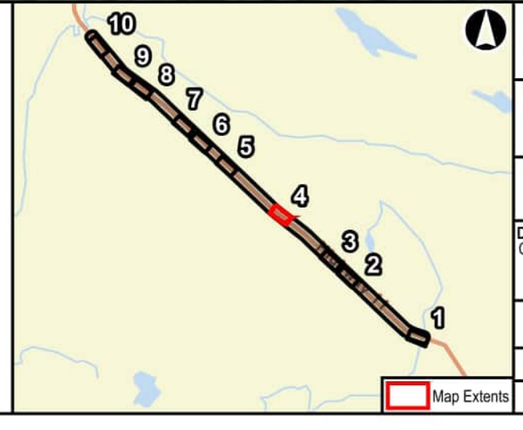
Basemaps provided by: Maxar, Microsoft, Province of Ontario, Esri Canada, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, NRCan, Parks Canada

LEGEND

- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Permanent-Warm
- Erosion/Sediment Deposition
- Impediment to Fish Passage
- Groundwater Indicator



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Fish and Fish Habitat Existing Conditions

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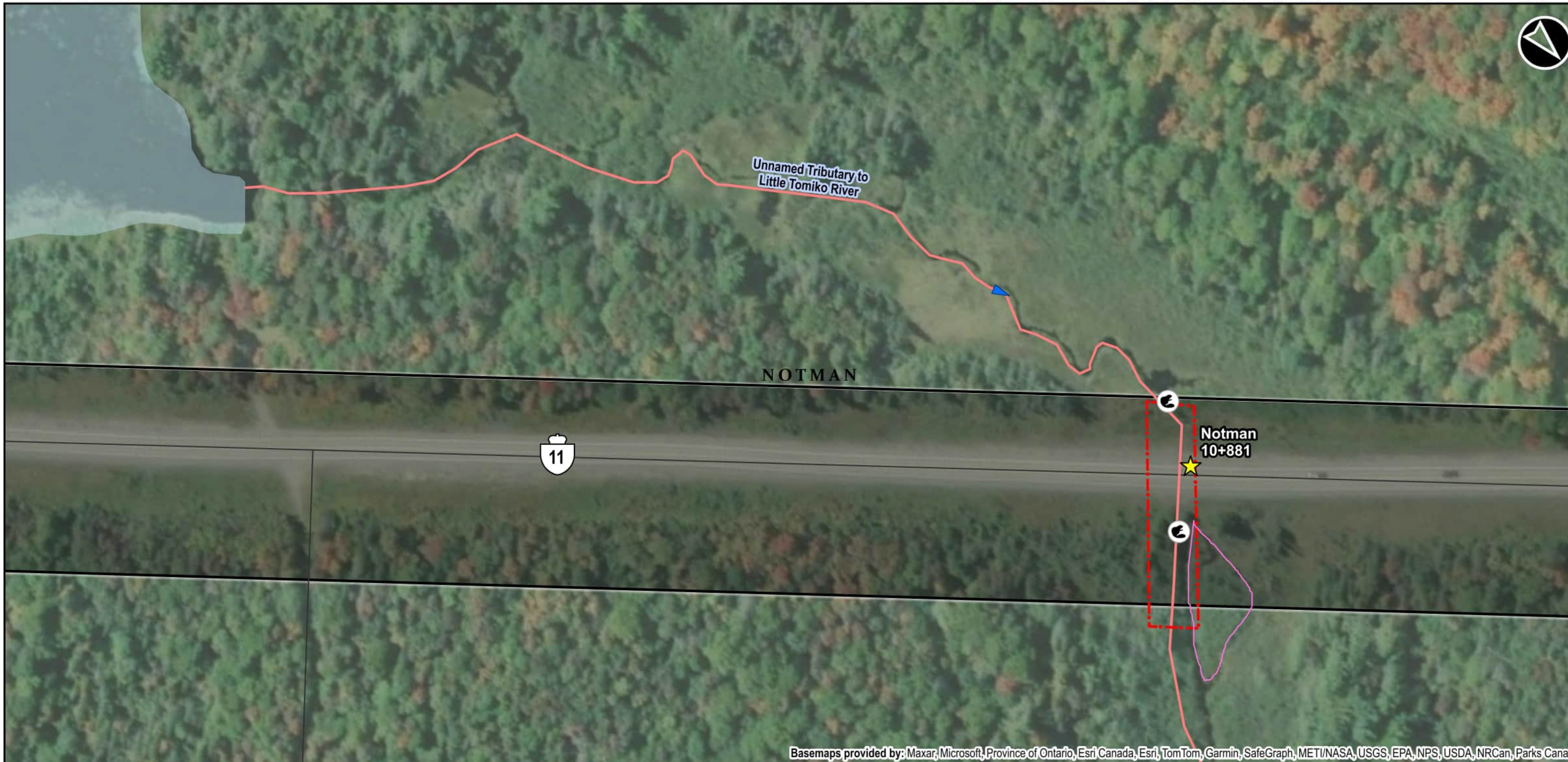
Appendix A-4



LEGEND

- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Permanent-Warm

Suitable Spawning Habitat

- Northern Pike
- Beaver dam

Fish and Fish Habitat Existing Conditions Report - Preliminary Design and Class Environmental Assessment (EA) Study for Highway 11 2+1 GWP 5121-21-00

Fish and Fish Habitat Existing Conditions

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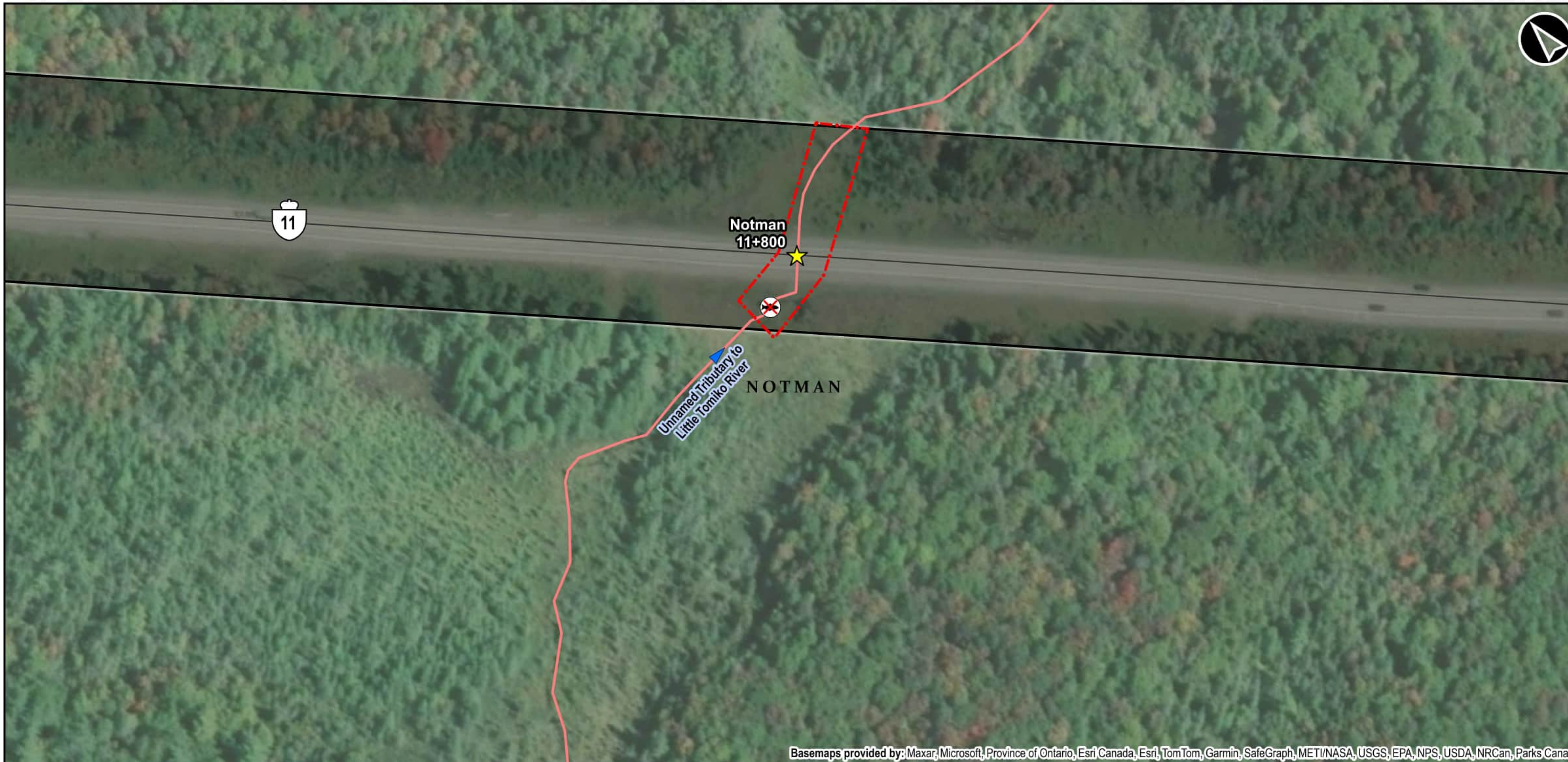
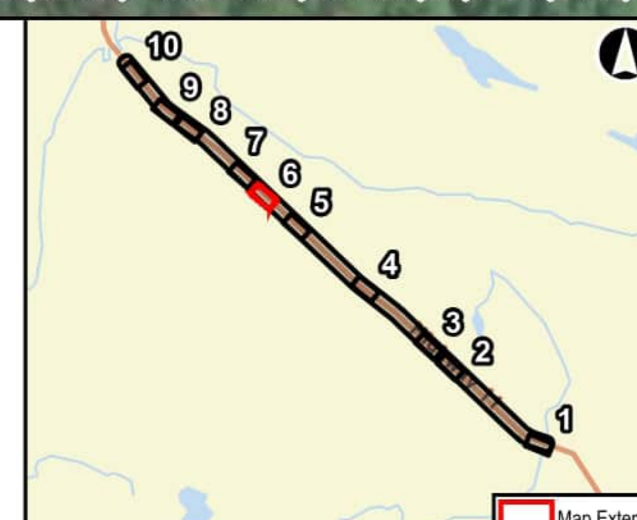


LEGEND

- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Permanent-Warm
- Impediment to Fish Passage



Fish and Fish Habitat Existing Conditions Report - Preliminary Design and Class Environmental Assessment (EA) Study for Highway 11 2+1 GWP 5121-21-00

Fish and Fish Habitat Existing Conditions

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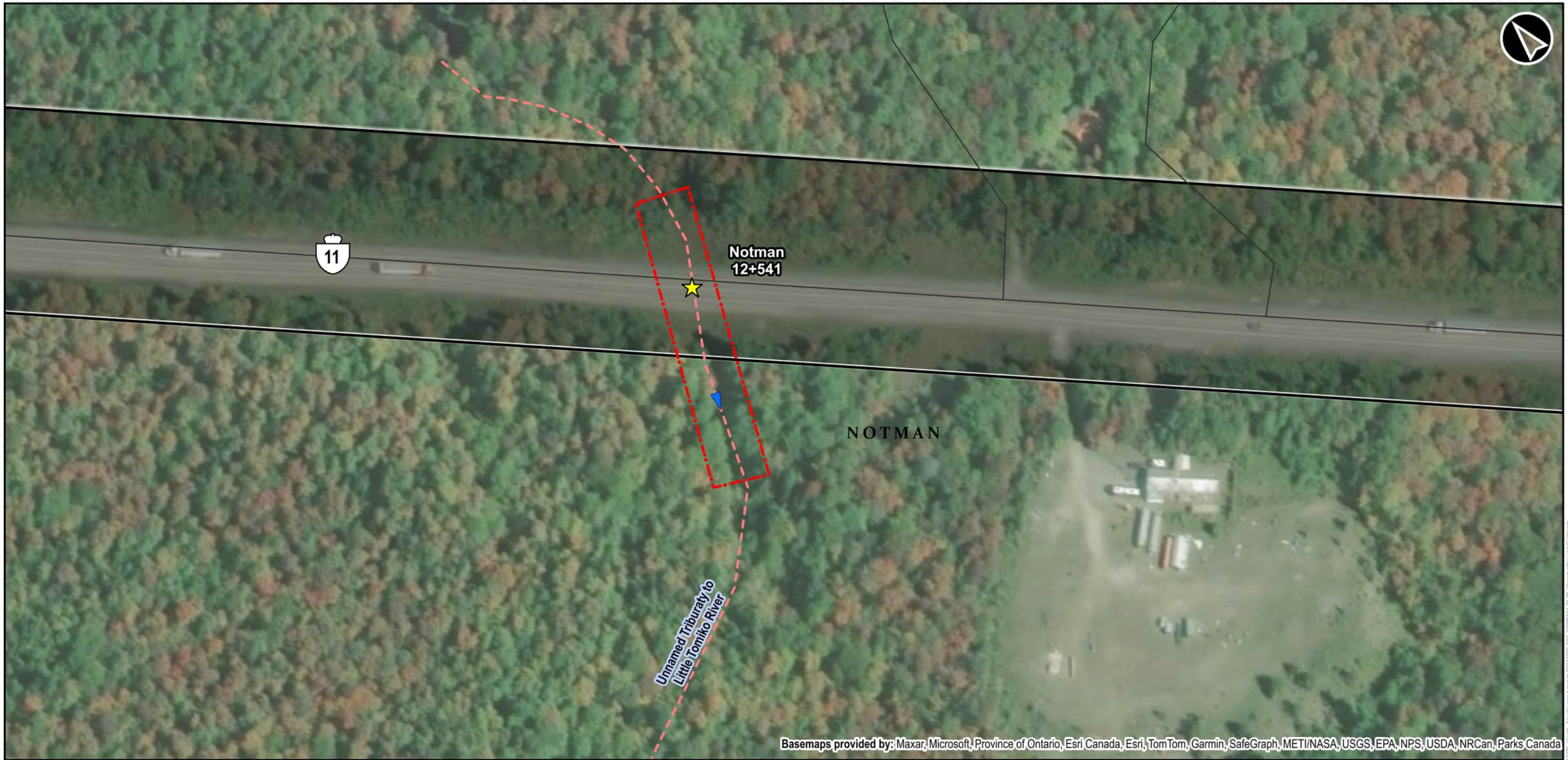
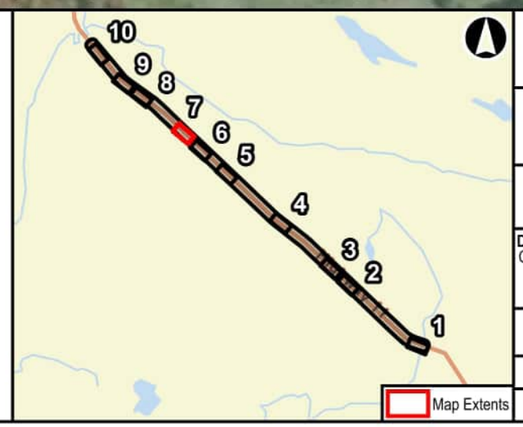


LEGEND

- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Intermittent-Warm



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Fish and Fish Habitat Existing Conditions

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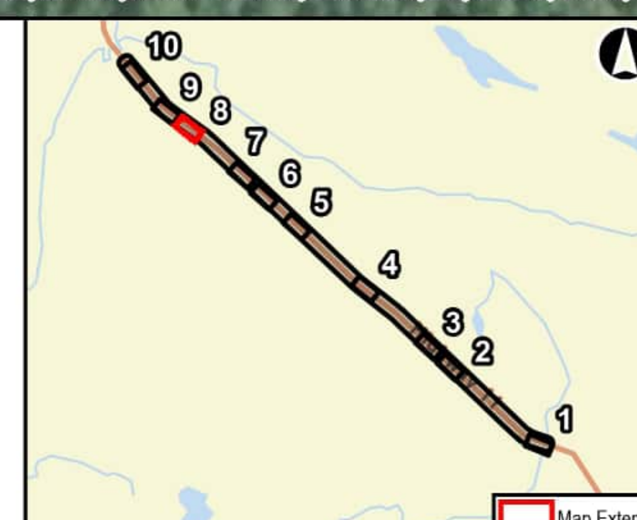
Appendix A-7

LEGEND

- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Permanent-Warm
- Intermittent-Warm
- Erosion/Sediment Deposition
- Impediment to Fish Passage



Fish and Fish Habitat Existing Conditions Report - Preliminary Design and Class Environmental Assessment (EA) Study for Highway 11 2+1 GWP 5121-21-00

Fish and Fish Habitat Existing Conditions

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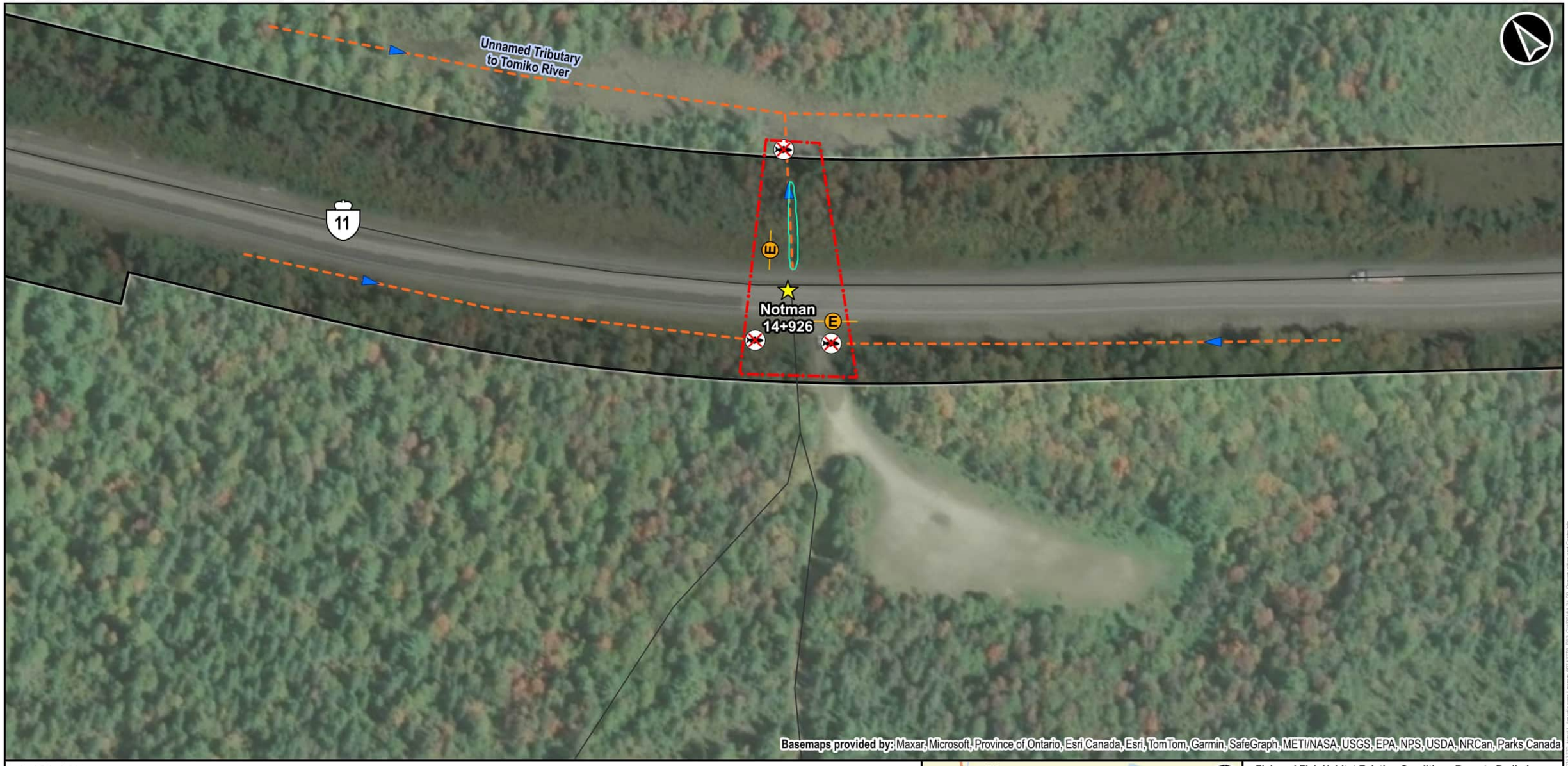


LEGEND

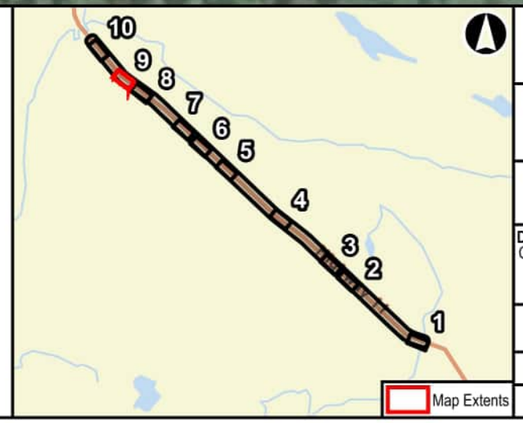
- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Intermittent-Warm

Suitable Spawning Habitat

- Brook Trout
- Erosion/Sediment Deposition
- Impediment to Fish Passage



Fish and Fish Habitat Existing Conditions Report - Preliminary Design and Class Environmental Assessment (EA) Study for Highway 11 2+1 GWP 5121-21-00

Fish and Fish Habitat Existing Conditions

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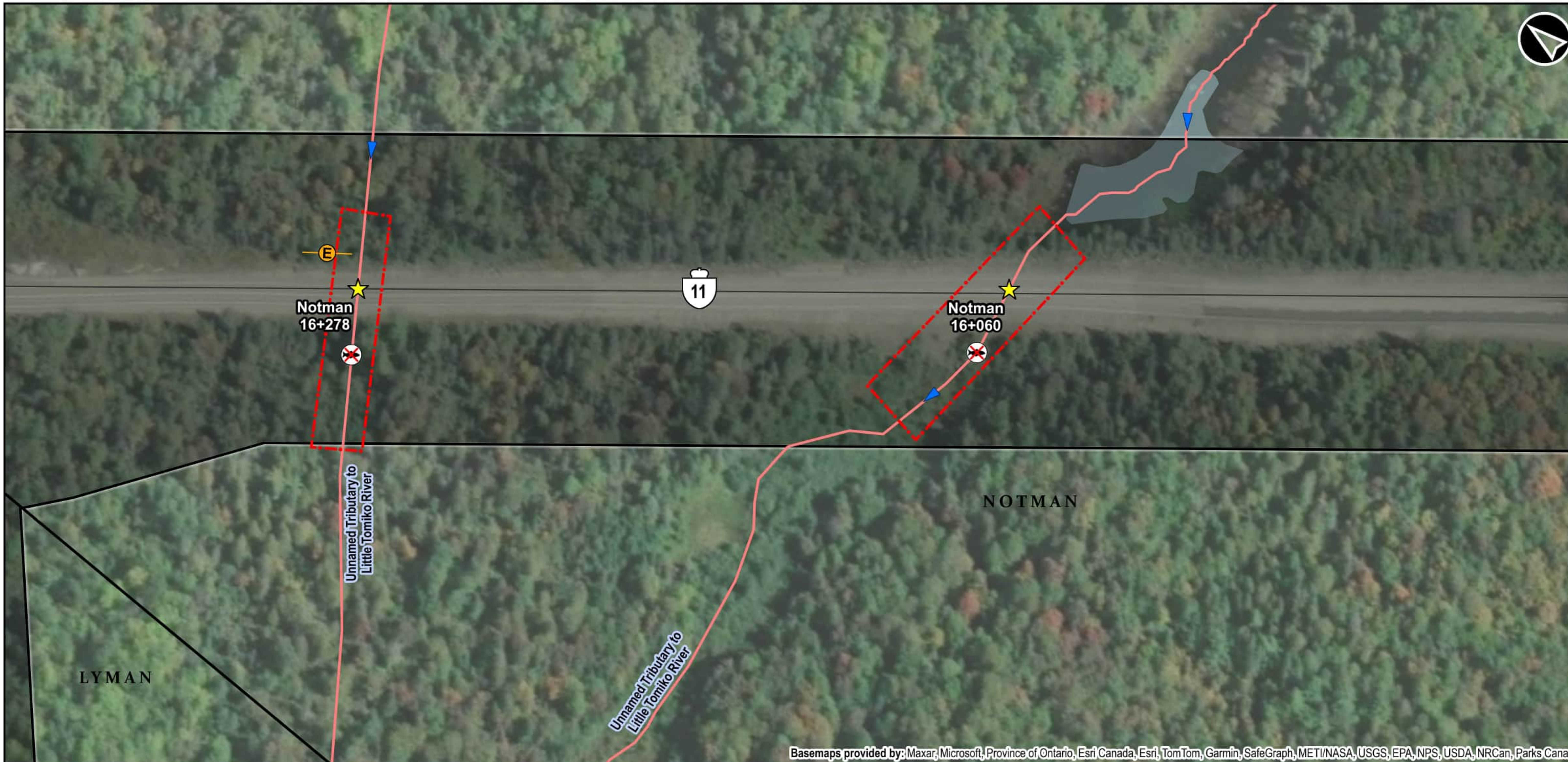
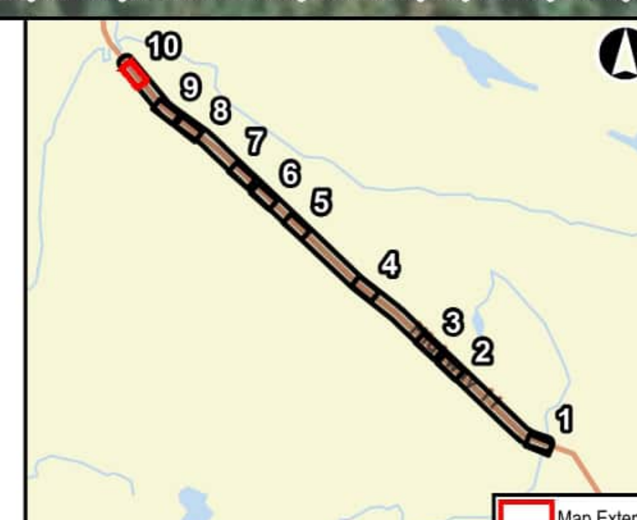


LEGEND

- Preliminary Project Limits
- Zone of Detailed Assessment
- Township
- Site
- Direction of Flow

Flow-Thermal Regime

- Permanent-Warm
- Erosion/Sediment Deposition
- Impediment to Fish Passage



Fish and Fish Habitat Existing Conditions Report - Preliminary Design and Class Environmental Assessment (EA) Study for Highway 11 2+1 GWP 5121-21-00

Fish and Fish Habitat Existing Conditions

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Appendix A-10

Appendix B

Agency Correspondence

From: Moreau, Lynn (MNRF)
Sent on: November 30, 2023 12:17:17 PM
To: projectteam@highway11pilot.ca
Subject: RE: Highway 11 Pilot Project-Preliminary Comments (Biological and Planner Review)
Attachments: BMP_Reptile_and_Amphibian_Exculsion_Fencing.pdf (737.75 KB), BMP_Mitigating_Effects_of_Roads_on_Herp.pdf (5.59 MB), GHD_Blanding's_Turtle.pdf (299.49 KB), Survey_Protocol_Blanding's_Turtle.pdf (3.13 MB)

Good Day Kyle,

I just realized I forgot to include the attachments which our Biologist has provided to assist in development of your reports.
Please find them attached here:

- BMP for Reptile and Amphibian Exclusion Fencing
- BMP Mitigating Effects of Roads on Herpetiles
- GHD Blanding's Turtle
- Survey Protocol Blanding's Turtle.

If you have any questions feel free to contact me.
Lynn

Best regards,
Lynn

Lynn Moreau
Regional Planner

Land Use Planning & Strategic Issues Section
Regional Operations Division-Northeast Region
Ministry of Natural Resources and Forestry
Cell: (705) 491-2052
Pronouns: she/her

From: Moreau, Lynn (MNRF)
Sent: November 30, 2023 11:59 AM
To: projectteam@highway11pilot.ca
Subject: RE: Highway 11 Pilot Project-Preliminary Comments (Biological and Planner Review)

Good Day Kyle,

Thank you for the opportunity to review the Highway 11 Pilot Project. Please take the following preliminary comments into consideration as you proceed with project planning.

Biological Comments:

Note on Review
I was only provided with a general description and low detail map of the proposed project area. As such I could not be certain of the start and endpoints of the proposed work area which may mean that some information was missed during this review. All reviews must provide coordinate locations or mapping information which can be used to pinpoint the precise locations.

Summary of Proposal
The Ministry of Transportation (MTO) is proposing to widen Highway 11 in two locations north of North Bay.

Aquatic Concerns

Several streams with varying thermal regimes intersect the proposed work areas. It is expected that the water crossings in these locations would have to be extended to accommodate the additional lane. The locations where this is expected to occur is at the following locations:

GWP 5033-22-00
• 17T 593495 5191150
• 17T 592463 5189491
• 17T 591823 5188642
• 17T 591756 5187763
• 17T 591742 5187187
• 17T 591744 5186544
• 17T 591716 5186196
• 17T 591447 5184082
• 17T 591291 5182124

GWP 5151-21-00
• 17T 605005 5189890
• 17T 607524 5156544
• 17T 608082 5156017
• 17T 608744 5155379
• 17T 512580 5151920
• 17T 614762 5150058

All streams should be assessed by MTO for the presence/absence of fish species and to determine if any critical habitat (spawning beds) is present and will be impacted by the proposed construction. Once the streams have been assessed this information can be provided to the Ministry of Natural Resources and Forestry Management Biologist for direction on timing restrictions.

There is a mapped walleye spawning location where the project area intersects a unnamed stream. This location is:
• 17T 591762 5187765

Given the extensive nature of this project it is recommended that the Ministry of Transportation (MTO) seek a Fisheries Act review to confirm there are no additional concerns.

Wildlife Habitat and Wetlands
There are numinous Moose Aquatic Feeding Area (MAFA) which intersect the location of the highway widening. Where possible aquatic vegetation should not be removed from these wetlands to reduce the impact to MAFA's.

None of the wetlands which intersect the proposed work area have been assessed to determine if they are provincially significant or not. An assessment of these wetlands should be conducted prior to the start of construction to confirm all the potential impacts of the proposed work.

Parks and other Protected Areas
The Enhanced Management Area (EMA) Marten River (E154r) occurs less then 1 km away from the project area (GWP 5151-21-00). While the proposed construction is unlikely to impact the EMA all project proposal should be consistent with the direction for the EMA. Additional information regarding what is permitted can be obtained from reviewing the Martin River Provincial Park Management Plan.

Species at Risk
A review of the subject property and the surrounding area identified several Species at Risk (SAR) which are known or suspected to occur in this area. This species include:

GWP 5033-22-00
• Barn Swallow (Special Concern);
• Bank Swallow (Threatened);
• Black Ash (Endangered);

• Canada Warbler (Special Concern);
• Chimney Swift (Threatened);
• Common Nighthawk (Special Concern);
• Eastern Wood-pewee (Special Concern);
• Evening Grosbeak (Special Concern);
• Olive-sided Flycatcher (Special Concern)
• Snapping Turtle (Special Concern).

GWP 5151-21-00
• Barn Swallow (Special Concern);
• Blanding's Turtle (Threatened);
• Canada Warbler (Special Concern);
• Chimney Swift (Threatened);
• Common Nighthawk (Special Concern);
• Eastern Whip-poor-will (Threatened);
• Evening Grosbeak (Special Concern);
• Snapping Turtle (Special Concern).

Blanding's Turtle been detected directly adjacent to the project area (GWP 5151-21-00). This means that the habitat protection would be triggered by the General Habitat Description (GHD; see supporting document folder) for Blanding's Turtle. It is highly recommended that the MTO reach out to the Ministry of Environment, Conservation and Parks (MECP) Species at Risk Branch (SARB) to have a formal review conducted under the Endangered Species Act (ESA) to ensure there are no contraventions. This should be done well in advance (two years) to ensure that if an authorization is required under the ESA that there is sufficient time to process and issue the authorization prior to the start of construction.

To limit the impacts to special concern species and bird protected Migratory Birds Convention Act (MBCA) the following considerations should be incorporated into the work plan.

If work is completed during the active season for reptiles and amphibians (April 1 to October 31) then exclusion fencing must be erected prior to the initiation of any work to ensure that reptiles and amphibians cannot enter the work area and become harmed or killed. Once the exclusion fencing is in place the work area must be searched for any wildlife which may have become trapped within the exclusion fencing during its installation. These animals must be removed from the work area and placed outside of the fencing. This fencing must be suitable to prevent reptiles and amphibians from entering the work area and be designed and maintained to provincial standards

Trees to be removed for this proposed road can only occur outside of the Breeding Bird nesting period (April 1st to August 31st). This will ensure that no bird species listed as special concern are impacted while nesting and ensure that impacts to bird species protect under the Federal Migratory Bird Convention Act are reduced or eliminated.

Terrestrial Concerns
Overall impacts to the terrestrial landscape are expected to be significant given the amount of habitat that will now be disturbed. While this proposed project is directly adjacent to the existing highway the widening of the highway will act as barrier to wildlife movement.

Invasive Species
The proponent must not deposit, release or transport an invasive species listed as prohibited or restricted under the Invasive Species Act.

If any prohibited invasive fish, invertebrate or plant species that are caught during the undertaking of this permit must be immediately destroyed to ensure it can't reproduce or grow.

The construction and use of additional road way increases the likelihood new invasive will be brought into the area. Efforts must be made during construction to reduce the likelihood that invasive species will be introduced. This should include the use of clean material, regularly cleaning trucks and other transport equipment and

Project Completion and Future Use
By providing greater access to northern Ontario means that its natural resources will be exploited to a greater degree.

Increased road width and a likely increase in traffic and speed means that there will be an increase in the amount of roadkill which occurs in this area. Consideration should be given to installing permanent exclusion fencing sufficient to block the passage of large game, reptiles and amphibians.

OTHER INFORMATION/DIRECTION FOR CLIENT

A number of best management practices have been attached to this review for the proponents consideration and reference.

If any animals are injured during the undertaking of this proposed work the proponent will immediately cease work and arrange for an Wildlife Rehabilitator to care for the animal. The proponent will then contact the North Bay Ministry of Natural, Resources and Forestry to inform them of the injuries and to seek direction on how to proceed.

If any animals or fish are killed during the undertaking of this work permit the proponent will immediately cease work and contact the North Bay Ministry of Natural, Resources and Forestry to inform them of the deaths and to seek direction on how to proceed.

Planner Comments:
The Notice of Study Commencement has the incorrect townships indicated for each of the study areas-they are mixed up.

The following comments apply from Jumping Caribou Road going south to 4.6 km north of Highway 64: Starting from Jumping Caribou Road south: There is an electrical distribution line (Permit No HO-2002-PLA-00017) held under Land Use Permit that crosses the highway approx 355 m south of Jumping Caribou Lake Rd. There are a number of unevaluated wetlands within the study area.

There are two research points (FEC-SC-14) and (FEC-SC-15) on the east side in the general vicinity of Rattler Road. Contact: Peter Uhlig, Program Lead, Ecological Land Classification Program. Status (Not Protected). They are 193 m east of the highway.

There is a privately owned parcel of land situated across from Rattler Road (OGF ID: 69323224) in Olive Township. The Crown Parcel Identification Number is 1509443. (Check Geowarehouse). It parallels the road for approx 726 metres on the east side.
There is another unevaluated wetland approximately 2 km south of Jumping Caribou Road along with a small unnamed body of water on the east side of the highway within Olive Township. Flow direction is to the south.

Mining Claims:
705936-Robert Joseph Kosy
705937-Robert Joseph Kosy
710439-Robert Joseph Kosy

Unevaluated wetland-at 3.08 km south of Jumping Caribou Rd flows east to small body of water situated 0.18 km east of the highway. Water continues to flow southward along the eastern periphery of the highway joining with another small body of water. North of Tonomo Lake Road there is another wetland (fen) directly west of the highway and it receives flow from another wetland on the highway's east side.

Research plot-located on Tonomo Lake Road approx 619 m west of the highway. Private property-located on Tonomo Lake Road 237 m west of the highway.

There is a walleye spawning area located just south of Tonomo Lake Road on the west side of the highway at Opechee Creek. Here water flows to the south. There is a swamp wetland in the vicinity. At this same vicinity there is a electrical distribution line LUP HO-2022-PLA-00017. Directly adjacent to this there is patented land owned by another Provincial government agency. (Check this).
At this same location there is an unamed small lake (west side).

There is a BMA TE-40-060 south of Tonomo Lake Road.

There is a natural gas pipeline CL 1333 (Crown Disposition Easement) on the west side of the highway (Olive Twp)
At 3762 Highway 11 there is a privately owned property.

There is an electrical distribution line (HO-2022-PLA-00017) that continues north-south along the highway in the Richfield Road general vicinity.

There is a privately owned parcel of land opposite Richfield road. It is directly adjacent the highway.

At 12 Richfield Road there is a property owned by the Municipality of Temagami. (west of highway). It is approx 105 m west of the highway. South of this, there are two large unevaluated wetlands adjacent the highway on the east side. Olive Lake is considered a warmwater fishery and is located west of the highway.

There is a research plot Protected (Full Protection) located on the east side of the highway east of Opechee Lake's northernmost branch. It is approx. 1029 m east of the highway. Contact is Alison White, S Forest Productivity Specialist (416) 721-2714 Alison.LWhite@ontario.ca. This is a growth and yield permanent sample plot managed by MNRF-BAMS. No disturbance of any kind is allowed within the protected research value.

The following comments apply from Sand Dam road to Ellsmere Road:

There is a privately owned parcel of land on the west side of Sand Dam road in proximity to the Highway. There is a natural gas pipeline Crown Disposition easement suvey location number CL 2633 located just south of Sand Dam Road and branching to the northeast crossing Sand Dam Road. There is a Land Use Permit HO-2022-PLA-00017 for an electrical distribution line located on the east side of the highway for approx. 600 m. This area is located within trapline NB 032. There is a large unevaluated wetland (swamp) on both sides of the highway at this location. Stewart Hammel Road has a privately owned parcel on the east/northeast side. The natural gas pipeline parallels the highway on the southern side (Crown Distribution Easement).

In Blyth Township there is a disposition for Tree Tapping on the West side that is 3.4 ha in area. The area is held by a Land Use Permit number 1554-1010777. Overlapping this same location is a large Research Polygon study name: Wildlife Monitoring and Assessment (Retired). Contact: Philip Dewitt, Provincial Wildlife Monitoring Program Lead (705) 755-1552. Plot Identifier 09032-PB-D-1999. This polygon crosses the highway and includes land on both sides. Its general location is at the junction of Stewart Hammel Road and Highway 11.

An elongated unevaluated wetland (fen) runs along the southern portion of the highway for quite some distance moving north.

A Private Recreation Camp (Members of the Stag Hunt Club) is held under Land Use Permit and is located 32 m (approx) east of the highway (Con 5 Lot 4 Blyth) . It is located south of a road that branches east off the highway (unnamed road).

751765-Brian G Windsor Mining Claim (just north Stewart Hammel)

There is a research Point FEC-CO-02-1084 which is part of the study " Central Ontario Forest Ecosystem Classification". Contact Name is Peter Uhlig, Program Lead, Ecological Land Classification Program (705) 946-7478. It is not protected. It is located on the west side approx 212 m of the highway west of a small water body.

There is a research plot (Con 6, Lot 4 Blyth) for Growth and Yield (contact Alison White (416) 721-2714) that is plot Identifier NOR 2013002PSP. No disturbance of any kind is allowed within the protected research value. It is 257.8 m from the highway centre.

There is a Private Recreation Camp (Crown Disposition LUP) located in Notman Twp Con 1 Lot 7 beside a water body on the west side of the highway. HO-2022-PLA-00017. is directly across the highway and is an electrical distribution line that flows to a privately owned parcel on Con 1 Lot 7.

There is a LUP for Tree Tapping (Pending) located in Con 1 Lot 8. This LUP needs to be checked to determine if it actually exists. (Purple block).

There is a Communications Tower Crown Lease (CL 9865) Registered Plan No. 36R-10330 (Lands File No 194777) located on the north side of the highway in Lot 8 Con 1 Notman Twp.

Within Con 2 Lot 9 (Notman) there is a LUP for Tree Tapping Permit No 1554-1010638. It is directly adjacent to the highway's east side. There is a private parcel located directly across from it.

There is an assessment parcel located on Lot 1 Con 8 on the north side of the highway (east side) that is close to the highway. (more info needs to be researched for this.)

General: The Natural Heritage Information Centre should be contacted (MECP) for more information on species at risk located within the areas.

Natural heritage areas: There are no identified natural heritage areas within the identified project areas.

The southerly expansion area is located within G 1941 (Tomiko Lake Area). Road development and maintenance (new) is permitted within this policy area, in accordance with the locations and policies proposed in the Ministry's Access Point Policy. Road use (public) new-Roads are permitted in accordance with the locations and policies proposed in the Ministry's Access Road Policy.

The northerly expansion area-From Jumping Caribou Road to north of Highway 64 is located within G 1968 (Milne Lake General Use Area). Within this area, Road Development and Maintenance (new) is permitted and new roads may be permitted subject to the applicable planning process. No new unplanned motorized access to lakes is permitted.

The more southern portion of this stretch is located within policy area G 1970-Jumping Caribou Lake policy area. Part or all of this Management Area contains lands set aside pending resolution of the Temagami area aboriginal land claim. Road Development and Maintenance is permitted and new roads may be permitted subject to the applicable planning process. No new unplanned motorized access to lakes and to E 339r-Wasaksina Lake is permitted.

E154r (Marten River EMA) is located in the area west of the highway around Opechee Lake. It is a Recreation Enhanced Management Area. Road Development and Maintenance (New) is permitted. The Nipissing Crown Game Preserve makes up most of the eastern half of the enhanced management area. A portion of the area is subject to First Nation land claims negotiations. A 120 m Area of Concern will be applied to all Natural Lake Trout Lakes in the area. Crown Land Disposition may be permitted and there are significant restrictions on land disposition on designated lake trout lakes. Road development and maintenance (new) is permiitted. Where the Recreation Enhanced Management area has been identified to protect remote recreation values, industrial activities and the related construction and use of new roads needs to be carried out in such a way as to maintain or enhance the remote recreation qualities. Roads may be constructed in accordance with MNR's access road policy. Semi-remote tourism areas and important recreational areas will be protected through future semi-remote access planning. No new primary or secondary roads or landings shall be constructed within 300 m of Gooderham, Otter and Little Otter Lakes.

Please feel free to contact me if you have any additional questions or concerns.

Lynn Moreau
Regional Planner

Land Use Planning & Strategic Issues Section
Regional Operations Division-Northeast Region
Ministry of Natural Resources and Forestry
Cell: (705) 491-2052
Pronouns: she/her

From: projectteam@highway11pilot.ca <projectteam@highway11pilot.ca>
Sent: October 31, 2023 9:25 AM

To: Moreau, Lynn (MNRF) <Lynn.Moreau2@ontario.ca>
Subject: RE: Highway 11 Pilot Project

Thank you for your interest in the Highway 11 2+1 Pilot Project and Detail Design Study.

We have included you on our Project contact list. Please find attached a digital copy of the Notice of Study Commencement for the Project, issued on October 25, 2023.

You will be notified through email of future public information centres and updates for this Study. For further information, visit the study website: www.highway11pilot.ca.

Sincerely,

The Highway 11 2+1 Pilot Project Team

Email: projectteam@highway11pilot.ca

You are receiving this email because you have contacted the Project Team for the Highway 11 2+1 Pilot Project and/or are on the contact list for the Detail Design Assignment. At any time, you may unsubscribe or update your contact information by emailing projectteam@highway11pilot.ca

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From: Moreau, Lynn (MNRF) <Lynn.Moreau2@ontario.ca>
Sent: Monday, October 30, 2023 12:57 PM
To: projectteam@highway11pilot.ca
Subject: Highway 11 Pilot Project

Hi Kyle,

Please add my email to your distribution list for this project.
Thank you!
Lynn

Lynn Moreau
Regional Planner

Land Use Planning & Strategic Issues Section
Regional Operations Division-Northeast Region
Ministry of Natural Resources and Forestry
Cell: (705) 491-2052
Pronouns: she/her

Appendix C

Photographic Log

Photographic Log

Client Name:	Report Name	Project No.
Ontario Ministry of Transportation	Fish and Fish Habitat Existing Conditions Report: Highway 11 Improvements from Sand Dam Road north to Ellesmere Road (13.8 km) (GWP 5151-21-00)	6071379

Photograph 1 ↑
Merrick – 15+975: May 3, 2024. View of downstream Zone of Detailed Assessment (ZDA), facing downstream (south). Spill socks present on water's surface, view from Highway 11 culvert.

Photograph 2 ↑
Merrick – 15+975: May 3, 2024. View of upstream ZDA, facing downstream (southwest) from Stewart Hammel Road. Suitable habitat for Brook Trout (*Salvelinus fontinalis*) spawning habitat observed in this zone.

Photograph 3 ↑
Merrick – 15+975: August 6, 2024. View of upstream ZDA, facing upstream (northeast) from Stewart Hammel Road crossing.

Photograph 4 ↑
Merrick – 15+975: August 6, 2024**.** Upstream ZDA. Exposed soil and undercut banks directly upstream of Highway 11, facing right bank.

Photograph 5
Merrick – 15+975: August 6, 2024. View of downstream ZDA, facing upstream (northeast) towards culvert outlet.

Photograph 6
Merrick – 15+975: May 3, 2024. View of suitable spawning habitat for Northern Pike (*Esox lucius*) on left bank upstream of Stewart Hammel Road, facing northwest.

Photograph 7
Merrick – 16+035: May 3, 2024. View of upstream ZDA, facing northwest. No crossing structure; natural channel filled in for highway causeway. Channel straightened to re-direct flow at 15+975. Suitable spawning habitat for Northern Pike.

Photograph 8
Merrick – 16+035: May 3, 2024. View of downstream ZDA and suitable spawning habitat for Northern Pike, facing downstream (south).

Photograph 9 ↑
Merrick – 16+035: August 6, 2024. View of upstream ZDA, facing downstream (west).

Photograph 10 ↑
Merrick – 16+035: August 6, 2024. View of upstream ZDA facing downstream (east) in side channel towards culvert inlet at 15+975.

Photograph 11 ↑
Blyth – 12+725: April 29, 2024. View of upstream ZDA, facing upstream (northeast) from highway. Boulders at crest of inlet pool may impede fish passage.

Photograph 12 ↑
Blyth – 12+725: April 29, 2024. View of downstream ZDA from highway, facing downstream (west). Channel narrows through wetland beyond outlet pool.

Photograph 13
Blyth – 12+725: August 6, 2024. View of upstream ZDA and culvert inlet, facing downstream (west).

Photograph 14
Blyth – 12+725: August 6, 2024. View of downstream ZDA and culvert outlet, facing downstream (southwest).

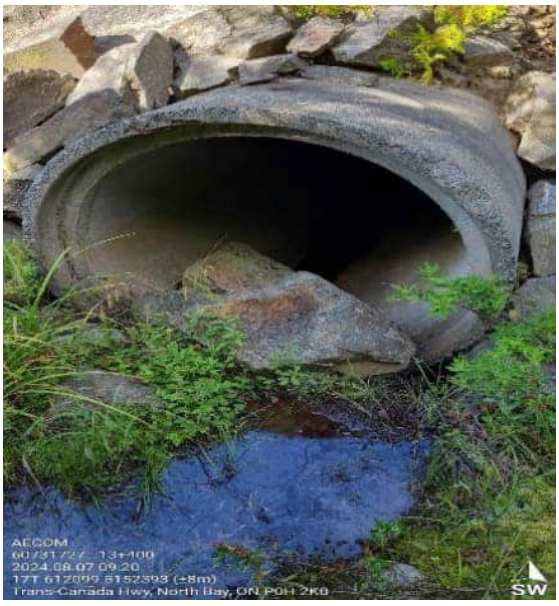
Photograph 15
Blyth – 13+400: April 30, 2024. View of upstream ZDA facing upstream (east) toward roadside cattail stand and water collection area.

Photograph 16
Blyth – 13+400: April 30, 2024. View of upstream ZDA and culvert inlet, facing downstream (northwest). Boulder and debris at inlet one of several potential fish passage impediments.

Photograph 17 ↑
Blyth – 13+400: April 30, 2024. View of downstream ZDA, facing downstream (west) from culvert outlet.

Photograph 18 ↑
Blyth – 13+400: April 30, 2024. View of receiving wetland in downstream ZDA. Facing southwest from the outlet to the wetland.

Photograph 19 ↑
Blyth – 13+400: August 7, 2024. View of upstream ZDA, facing upstream (southeast) from highway embankment.



Photograph 20 ↑
Blyth – 13+400: August 7, 2024. View of culvert inlet facing southwest. Boulder and debris at inlet one of several potential fish passage impediments.

Photograph 21
Blyth – 13+400: August 7, 2024. View of downstream ZDA, facing upstream (east) toward culvert outlet.

Photograph 22
Blyth – 13+400: August 7, 2024. View of downstream ZDA, facing upstream (northwest) in the receiving online beaver pond flowing southerly and parallel to Highway 11 on the southwest side.

Photograph 23
Blyth – 15+512: April 30, 2024. View of downstream ZDA, facing upstream (east) towards culvert outlet.

Photograph 24
Blyth – 15+512: April 30, 2024. View of the upstream ZDA, facing upstream (north).

Photograph 25
Blyth – 15+512: August 23, 2023. Downstream. Conditions at culvert outlet from AECOM Culvert Inspection Report (2024).

Photograph 26
Blyth – 15+512: April 30, 2023. View of the downstream ZDA, facing downstream (northwest) along channel to wetland. Embankment erosion is shown, and deposited material was observed in this channel.

Photograph 27
Notman – 10+881: August 9, 2024.View of downstream ZDA. Facing downstream (northeast) form the culvert outlet.

Photograph 28
Notman – 10+881: August 9, 2024. View of the beaver pond in upstream ZDA, facing south.

Photograph 29
Notman – 11+800: May 2, 2024. View of culvert outlet, facing upstream (southwest).

Photograph 30
Notman – 11+800: May 2, 2024. View of upstream ZDA, facing upstream (southwest).

Photograph 31
Notman – 11+800: August 23, 2023. View of downstream ZDA. Facing downstream (northeast) from the highway.

Photograph 32
Notman – 11+800: August 23, 2023. View of culvert outlet. From AECOM Culvert Inspection Report (2024).

Photograph 33
Notman – 11+800: August 12, 2024. View of downstream ZDA, facing upstream (southwest).

Photograph 34
Notman – 12+541: May 2, 2024. View of upstream ZDA, facing upstream (north) from the highway.

Photograph 35
Notman – 12+541: May 2, 2024. View of upstream ZDA, facing culvert inlet (west).

Photograph 36
Notman – 12+541: May 2, 2024. View of downstream ZDA, facing downstream (southwest).

Photograph 37
Notman – 12+541: May 2, 2024. View of downstream ZDA, facing downstream (south) from highway.

Photograph 38
Notman – 12+541: May 2, 2024. View of the defined channel flowing though forest in downstream ZDA below pooling water, facing southwest.

Photograph 39
Notman – 14+073: May 2, 2024. View of downstream ZDA, facing downstream (southwest) from highway.

Photograph 40
Notman – 14+073: May 2, 2024. View of upstream ZDA. Facing upstream (northeast) from highway.

Photograph 41
Notman – 14+073: August 12, 2024. View of downstream ZDA, facing downstream (southwest).

Photograph 42
Notman – 14+073: May 2, 2024. View of downstream ZDA and channel through treed fen. Facing downstream (southwest).

Photograph 43
Notman – 14+408: May 3, 2024. View of downstream ZDA, facing downstream (northeast) from highway.

Photograph 44
Notman – 14+408: May 3, 2024. View of upstream ZDA, facing downstream along ditchline (west) toward culvert inlet.

Photograph 45
Notman – 14+408: May 3, 2024. View of straightened channel in downstream ZDA. Facing downstream (northeast).

Photograph 46
Notman – 14+408: May 3, 2024. View of culvert outlet.

Photograph 47
Notman –14+926: May 2, 2024. View of upstream ZDA. Facing upstream (southwest) from highway towards perched entrance culvert.

Photograph 48
Notman –14+926: May 2, 2024. View of upstream ZDA. Facing upstream (southeast) from entrance along ditchline. Perched entrance culvert (Photo 53) and riprap in ditch are both fish passage impediments..

Photograph 49
Notman –14+926: May 2, 2024. View of downstream ZDA, facing downstream (northeast) from highway.

Photograph 50
Notman –14+926: May 2, 2024. View of downstream ZDA, facing upstream (southwest) where defined channel travelled through forest between cattail marsh and highway. Suitable Brook Trout spawning substrate was observed in this section.

Photograph 51
Notman – 16+060: May 6, 2024. View of upstream ZDA. Facing upstream (east) from highway.

Photograph 52
Notman – 16+060: May 6, 2024. View of downstream ZDA. Facing downstream (west) along channel in thicket.

Photograph 53
Notman – 16+278 : May 7, 2024. Buried culvert outlet

Photograph 54
Notman – 16+278 : May 7, 2024.
View of pool at culvert inlet.

Photograph 55
Notman – 16+278: May 7, 2024. View of channel in downstream ZDA, facing downstream (west).

Photograph 56
Notman – 16+278: May 7, 2024. Defined channel with undercut banks downstream of culvert in ZDA.

AECOM

Appendix D

Field Data

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe		US ZDA 0-20m US of culvert	12+725	2024-04-29	Unknown	AI	16:05	17:06	Hwy 11 N Blythe Twp	46.5115	-79.5323		overcast clouds, wind 3-4	9.7	6.2	93	2 mm HH	4.65	10.5	Unnamed tributary	Sturgeon River	Blythe	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe		Downstream ZDA 12+725	12+725	2024-04-29	Unknown	AI	17:07	17:34	Hwy 11	46.5114	-79.5329		overcast clouds, 3, wind 3	4.98						Unnamed	Sturgeon River	Blythe	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	13+400	Downstream ZDA	13+400	2024-04-30	Unknown	AI	12:59	13:49	13+400 N of Sand Dam rd.	46.5162	-79.5394		overcast clouds	11.3	5	57	0	4.99	9	Unnamed tributary to Little Sturgeon River	Sturgeon River	Blythe	North Bay	Highways,Forest, Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 0m-30m DS		30m within ROW DS	13+928	2024-04-30	Unknown	PH	15:44	16:16	Hwy 11 north	46.5189	-79.5440		overcast clouds	6.91						Unnamed	Sturgeon River	Blythe	North Bay	Highways,Forest, Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 30m-50m DS		30m to 50m DS of culvert	13+928	2024-04-30	Unknown	PH	16:18	16:36	Hwy 11 north	46.5189	-79.5444		moderate rain	6.92						Unnamed	Sturgeon River	Blythe	North Bay	Forest,Highways
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 20m US		20m ZDA	13+928	2024-04-30	Unknown	PH	16:45	17:00	Hwy 11 North	46.5191	-79.5437		light rain	7.9						Unnamed	Sturgeon River	Blythe	North Bay	Highways,Forest, Meadow
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	13+400	Upstream ZDA	13+400	2024-04-30	Unknown	AI, PH	14:41	15:06	Highway 11	46.5156	-79.5385		overcast clouds	11						Unnamed tributary to Little Sturgeon River	Sturgeon River	Blythe	North Bay	Highways,Forest, Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	14+359	Downstream ZDA	14+359	2024-04-30	Unknown	AI	18:25		Highway11	46.5218	-79.5478		overcast clouds	10.88	6.6	216	4 mm	5.84	8.56	Unnamed tributary to Little Sturgeon River	Sturgeon River	Blythe	North Bay	Forest,Highways
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	14+359 Blythe	DS ZDA	14+359	2024-04-30	Unknown	AI, PH	19:01	20:15	Highway 11	46.5215	-79.5480		overcast clouds	10.93						Unnamed tributary to Little Sturgeon River	Sturgeon River	Blythe	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	14+359	US ZDA	14+359	2024-04-30	Unknown	AI, PH	19:53	20:14		46.5220	-79.5476		overcast clouds	11.88						Unnamed drainage to Little Sturgeon	Sturgeon River	Blythe	North Bay	Highways,Forest

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Describe Surrounding Land Use:	Pollution Sources:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe		Highway inputs	Other	Concrete pipe	1.5	1.5	US		0 to 20 m US of culvert	Steam_River	Permanent	0 to 20 m US of culvert ZDA, ZGA up to 50 m US of culvert.	20	Run,Pool	75	0.49	0.56	0.63	0.6	Boulder,Silt,Muck, Detritus,Clay		40			
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe		Highway	Other	Concrete pipe	1.5	1.5	DS ZDA 50 m ds of culvert including row		0 to 50 m DS of culvert	Steam_River	Permanent	Channel through swamp wetland	50	Pool,Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	Wetland	Highway	Open Foot Culvert		1.3	1.2	Reach 1		From 0 to 15 m DS of culvert	Steam_River	Permanent	DS detail of 15 m channel, flowing from culvert to beaver pond. Side channel, kot online with pond.	50	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 0m-30m DS	Hwy, ditch, forest	Hwy	Open Foot Culvert		1.9	1.9	30m within ROW DS		Hwy 11 North	Channelized	Permanent	30m directed along embankment of Hwy due to ditch.	30	Run	100	0.25	4	0.4	4.7	Silt,Boulder,Sand		5			5
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 30m-50m DS		Hwy	Open Foot Culvert		1.9	1.9	30m to 50m DS		Hwy 11 north	Steam_River	Permanent	Natural stream flowing into forest		Run,Riffle	80	0.15	0.65	0.35	0.86	Boulder,Cobble,Sand,Gravel,Silt,Detritus		20	20	10	25
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 20m US		Hwy	Open Foot Culvert		1.9	1.9	20m US		Hwy 11 north	Steam_River	Permanent	0-12m stream, 12-20m stream from cattail marsh	20	Run,Riffle,Flats	40	0.6	0.35	0.1	0.95	Silt,Muck,Cobble			20		
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	Wetland	Highway	Other	Concrete pipe	1.3	1.3	0 to 20 m US of culvert		From 0 to 20 m upstream of culvert, ZGA up to 50 m	Channelized	Permanent		20	Run	100	0.2	0.8	0.35	1.6	Boulder,Gravel,Sand,Silt		10		25	40
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe		Highway	Other	Either box culvert with extensive accumulated sediment or open foot	1	0.6	DS ZDA		From 0 to 15 m DS of culvert, mostly in ROW	Steam_River	Permanent		15	Run		0.2	2.4	0.3	3.4	Silt,Muck,Detritus					
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe		Highway	Open Foot Culvert				Downstream second reach		From 15 to 50 m DS of culvert	Steam_River	Intermittent	Added second reach, conditions differ significantly vs the 15 m from the culvert to edge of forest.	35	Run,Flats	20	0.15	1.2	0.25	1.7	Silt,Muck,Detritus					
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe		Highway	Open Foot Culvert		1.3	0.6	US ZDA		From 0 to 20 m US of culvert	Steam_River	Intermittent		20	Pool,Run	50	0.15	2.5	0.3	3	Silt,Muck,Detritus					

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe	30	5	15	10	100	25	0.8	8	0.85	8.5	Sand,Boulder,Gravel	20		25	55				100								
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe						20	0.9	4	1.15	5	Sand,Silt,Boulder,Muck ,Detritus	30			10	5	10	45	80								
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 0m-30m DS	20				70																						
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 30m-50m DS	5			20	100															20	0.12	0.6	0.3	0.8	Boulder,Cobble,Sand, Detritus		50
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 20m US	30		50		100															15	0.15	0.3	0.15	0.45	Boulder,Silt ,Muck		25
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	25																										
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	20		40	40																							
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	50		25	25																							
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	50		25	25		50	0.3	9			Silt,Sand,Detritus				25	50		25									

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe								80	0.4	2	0.65	2.2	Sand,Silt,Muck,Detritus					15	25		25	35					
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe								100	0.65	2.35	0.9	2.75	Sand,Silt,Clay,Detritus, Boulder,Gravel		5		5	30	30	5		25					
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 0m-30m DS																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 30m-50m DS	20		10			20	100																				
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 20m US				35	40		100	45	0.2	3	0.1	3.5	Silt,Muck						30		70		100				
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe								50	0.25	15	0.35	16	Muck,Silt,Detritus						50		25	25					
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe																											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe								Stable	Stable	Deposition Zone	Deposition Zone	Undercut_Banks,Boulders,Woody_Debris,Vascular_Macrophytes	20	10	35		40		15	60 to 89
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe								Stable	Stable	Deposition Zone	Deposition Zone	Cobble,Woody_Debris,Organic_Debris	20			10	60	30		60 to 89
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe								Stable	Stable	Protected Bank	Protected Bank	Boulders,Woody_Debris,Organic_Debris	15		25		50	25		30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 0m-30m DS								Stable	Stable	Vulnerable Bank	Protected Bank	Boulders,Organic_Debris,Woody_Debris	60		10		20	70		1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 30m-50m DS								Slightly Unstable	Slightly Unstable	Eroding Bank	Eroding Bank	Undercut_Banks,Boulders,Cobble,Woody_Debris,Organic_Debris	80	10	40	10	20	20		1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 20m US								Stable	Stable	Deposition Zone	Deposition Zone	Undercut_Banks,Boulders,Organic_Debris	70	5	25			70		1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe								Stable	Stable	Protected Bank	Protected Bank	Boulders,Woody_Debris,Vascular_Macrophytes,Cobble	30		20	40	30		10	60 to 89
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe								Stable	Stable	Deposition Zone	Deposition Zone	Vascular_Macrophytes,Organic_Debris	50					30	70	1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe								Stable	Stable	Vulnerable Bank	Vulnerable Bank	Woody_Debris,Organic_Debris	60				50	50		60 to 89
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe								Stable	Stable	Vulnerable Bank	Vulnerable Bank	Vascular_Macrophytes,Woody_Debris,Organic_Debris	40				30	20	50	30 to 59

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation(%):	Predominant Emergent Species:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe	More exposure during leaf off, but in leaf on most of channel shaded. Shrubs and abundant overhanging grass.	Submergent	100	Grass					No			None	None observed		None, maintain habitat
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe	Outlet plunge pool is open canopy but channel in shrub swamp 100% shaded by shrubs and grass. Riparian overhanging speckled alder and grass	None							No			None	None	Maintain habitat	Similar to US, active channel through swamp
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	Shade and cover feom ripqrian trews/saplings in ROW	None							No					Maintain habitat	Crossing directs flow as side input to online beaver pond on the pond's right bank. See second reach pond/lake form.
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 0m-30m DS	Very little riparian shruds	Emergent					85	Broadleaved cattail	Yes		Potential low flow barrier			Maintain habitat	
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 30m-50m DS	Few balsam fir branches overhamging, rocky banks, nit a lot of vegetation growing near	None							Yes	Steep drop DS of the 50m ZDA, permanent obstruction	Low flow, gradient subterrian dection DS			Maintain habitat	YSI not working, no water Chemistry
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 20m US	Eastern white cedsr, black ash, red oasuer dogwood, grasses all very sparse	Emergent					80	Reed canary grass	Yes		Lowflow, gradient at inlet		Maintain habitat		
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	Alder and shoreline riparian shrubs, adjacent forest	Submergent,Emergent	25	Submergent filamentous algae			75	Catttail, sedges, grasses, mostly in lowlying wetland area at US end of reach	Yes	Blast rock and debris at inlet imleding fish passage. Also velocity, depth and gradient in culvert permanent barrier to upstream movement of fish.	Low flow				Water flows from low lying cattail wetland along embankment. ZGA and wetland is pockets of open water and saturated cattail wetland approx 50 x 35m. Appears from aerial to be connected to US lake.
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	Provided by cattails only, little shade or canopy cover	Emergent					100	Cattails, sedges	No					Appears to be accumulated sediment in culvert	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe		None							Yes	Very steep grade downstream, same as previous. Surface water flows down slope and eventually to large wetland. No access for fish from DS habitat.	Low flow				
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe		Emergent					100	Cattail, sedges	Yes	Gradient barrier and flow. No connection upstream, flow originates from low lying surface water collection and ditch surrounded by slope on all sides.	Flow				

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe	Defined actice channel in ZDA flowing through approx 60 m wide shrubby swamp. Opens to inlet pool at culvert.
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe	Soft substrate in channel through shrub swamp, next to wetland on left bank. Right bank is treed, flows to wetland DS in ZGA. Old beaver dam, not active, not a barrier
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	Channel directing inputs to beaver pond/dammed watercourse that runs along the highway embankment. Wetland immediately adjacent to highway embankment before diverging south from highway
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 0m-30m DS	YSI Not working, not water chemistry. Runs parallel to the hwy for 30m DS than goes 90 perpendicular into forest.
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 30m-50m DS	
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 20m US	No connection found US, drainage water from hwy collecting in cattail marsh 30m us, unlikely fish habitat
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 Blythe	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	See watercourse form for reach 1 for water chem, etc. Channel well defined as it enters forwst but quickly dissipates in a low lying cedar alder swamp area. No bank definition or substrate sorting, water tolerant terrestrial veg. Flows to wetland that travels along the ROW but no access for fish from DS, severe gradient.
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 Blythe	Flow coming from vernal pool/low water collection area at the toe of surrounding slopes. No other input found, surface water.collection and from highway ditch. No connection to habitat US (and DS barrier as well).

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 50m ZDA		DS of culvert	10+072	2024-05-01	Unknown	PH	13:27	14:23	Hwy 11 North	46.5380	-79.5743		overcast clouds	7.95	6.2	163.1	0.05	6.18	10.36	Unnamed	Sturgeon River	Notman	North Bay	Forest,Highways
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 20m ZDA US		20m US	10+072	2024-05-01	Unknown	PH	14:36	15:09	Hwy 11 North	46.5381	-79.5739		overcast clouds	7.95						Unnamed	Sturgeon River	Notman	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	10+881	Downstream ZDA	10+881	2024-04-30	Unknown	AI, PH	04:00	17:11	Highway 11 Notman twp	46.5160	-79.5393		overcast clouds	6.91	9.7	71		5.32	9.61	Unnamed tributary to Little Tomiko	Sturgeon	Notman	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	10+881	Upstream ZDA 0 tp 10 m US of culvert up to beaver dam	10+881	2024-05-01	Unknown	AI, PH	17:53	18:05	Highway	46.5431	-79.5817		overcast clouds	11.05						Tributary to Little Tomiko	Sturgeon River	Notman	North Bay	Highways,Forest, Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	11+800	Downstream ZDA from 0 to 50 m DS of culvert	11+800	2024-05-02	Unknown	AI, PH	12:57	14:03	Highway 11	46.5492	-79.5900		overcast clouds	11	8.4	116.3	7 mm	5.7	6.65	Unnamed tributary to Little Tomiko River	Sturgeon River	Notman	North Bay	Highways,Forest, Other

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Describe Surrounding Land Use:	Pollution Sources:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 50m ZDA		Hwy	Open Foot Culvert		0.9	1	DS 50m ZDA		0-50m downstream of outlet, flowing into an unnamed lake.	Steam_River	Permanent	Natural stream, riffle from 0-7m with boulders, cobble, gravel and sand, steep gradient 0-5m below outlet. Gentle slope 5-10m (run) and 10-20m is a steep gradient riffle (almost cascade like) with boulers and bedrock exposed in the drops. 20 -30m gentle slope towards the lake, widening of the stream, more gravel sand and silt. 30-50m runs and channel splits into multiple channels into a cedar swap to then join back into	50	Run,Riffle	55	0.09	0.74	0.11	0.81	Gravel,Cobble,Boulder,Sand,Silt,Muck		5	35	30	10
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 20m ZDA US		Hwy	Open Foot Culvert		0.9	1	20m US		20m US from inlet, parallel to Hwy 11	Steam_River	Permanent	0-20m runs parallel to Hwy, 20m and over goes into the forest, define channel	20	Run,Riffle,Pool	70	0.22	0.7	0.3	1	Silt,Sand,Muck,Detritus,Boulder		10			40
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman		Highway	Open Foot Culvert		2		DS ZDA		0 to 50 m downstream of culvert	Steam_River	Permanent	From 0 to 50 m DS of ROW	50	Run	100	0.8	4.95	0.85	5.55	Sand,Silt,Muck,Boulder		5			70
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	Wetland	Highway	Box Culvert		1.8	1.3	Upstream ZDA	Wetland US	From 0 to 10 m upstream of culvert, up to beaver dam	Steam_River	Permanent		10	Run	100	0.3	2.6	0.55	3.2	Gravel,Sand,Boulder,Silt		20		10	60
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	Wetland	Highway	Open Foot Culvert		1	1.3	DS ZDA		0 to 50 m DS of culvert	Steam_River	Permanent	ZDA from 0 to 50 m DS of culvert including ROW	50	Run	100	0.5	1.53	0.33	0.73	Boulder,Cobble,Gravel,Sand,Silt,Detritus		5	5	30	35

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 50m ZDA	10		10		100															45	0.13	1.1	0.35	1.25	Bedrock,Boulder,Cobble,Gravel,Sand	5	45
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 20m ZDA US	30		10	10	100	10	0.35	0.26	0.2	0.55	Sand,Silt,Detritus,Muck,Boulder	5			60	15	10	10	100	20	0.11	0.6	0.3	1.3	Sand,Silt,Muck,Boulder,Detritus		15
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	20		5																								
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	10																										
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	10			15																							

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Project Number	Project Description	Crossing ID:	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 50m ZDA	35	10	5				100																				
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 20m ZDA US			35	30	10	10	100																				
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman																											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 50m ZDA								Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Undercut_Banks,Boulders,Cobble,Woody_Debris,Organic_Debris	70	15	25	35	15	10		30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 20m ZDA US								Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Boulders,Woody_Debris,Undercut_Banks	40	20	30		50			30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman								Stable	Stable	Deposition Zone	Deposition Zone	Woody_Debris,Boulders,Vascular_Macrophytes	15		5		75		20	60 to 89
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman								Stable	Stable	Deposition Zone	Deposition Zone	Undercut_Banks,Boulders,Woody_Debris,Vascular_Macrophytes	30	10	40		30		20	1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman								Stable	Stable	Deposition Zone	Deposition Zone	Boulders,Woody_Debris,Organic_Debris,Vascular_Macrophytes,Undercut_Banks,Cobble	60	5	5	5	15	10	60	60 to 89

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation(%):	Predominant Emergent Species:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 50m ZDA	Banks are eroding more un the riffle section leaving them vulnerable, 0-10m in ROW with little to no overhanging vegetation. 10-40m in forest with 70-90% canopy cover. 40-50m channel runs into a fen bordering a lake with no over.	None							Yes	Steep gradient in riffles where the bedrock is exposed creating a vertical drop of approx. 50cm. Steep gradient at culvert may present a barrier to fish passage	Low flow	Grasses, sedges near the lake (approx. 40m-50m DS of outlet) potential suitable spawning habitat for pike.		Stabalize the embakment of Hwy	Define channel splits in multiples smaller define channels into a cedar swamp(~35m DS) to than join (~40mDS) back into 1 define channel flowing into the Unnamed lake. Embankement material found washed away up to 30m DS. The runs (40-50m DS) are deeper ~ 20-40cm with mostly silt and sand and muck. 1 small pool created where the channels meet ~40m DS (30cmWx30xmLx40cmD).
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 20m ZDA US	Redoasier dogwood, speckeled alder, cedar, balsam fir all growing on the banks of the stream. Few banches overhanging but mosIty open	None							Yes	Gradient is an impedement to fish passage upstream				Stabilize embankement	Series of riffle runs pools resulting from washout embankement sediemnt, detridus and boulders. Define channel US beyond the 20m ZDA and coming from an upland forest.
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	Speckled alder and grass along both banks shading stream	Emergent,Submergent	5				100	Sedges	No			Suitable spawning habitat for Northern Pike in alder swamp on right/north bank. Swamp that floods seasonally and with finger channels with grasses and sedges throughout. Emergent vegetation and sheltered channels suitable spawning and nursery habitat.		Maintain habitat	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	Some grass and shrubs on shoreline, speckled alder	Submergent	100	Grass					Yes		Beaver dam				
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	Cover procided mostly by cattail sedges grasses overhanging the active channel. Some riparian speckled alder.	Submergent,Emergent	20	Grasses			80	Sedges, grasses, cattail	No						

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 50m ZDA	Small bodied fish observed ~45m DS.
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 20m ZDA US	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	Breached beaver dam but not impeding passage. Active defined channel bordered by alder in riparian and upland forest on left bank, right bank bordered by alder swamp with occasional pockets and channels of water. Water is high, at or just over bankfull.
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 Notman	Channel flowing from beaver dam to culvert. See pond form and DS form for water chem, etc.
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	Defined channel in saturated cattail wetland swamp. Old beaver pond reverting back to channel. Breached old beaver dam at 50 m, beyond beaver dam and in ZGA through forest is well defined channel with patches of substrate suitable for salmonid spawning. In ZDA defined channel though saturated swamp. Water is high, over bankfull of active channel. Swamp is approx 50 m wide. Channel and wetland are headwaters of Little Tomiko River

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	11+800	Upstream ZDA	11+800	2024-05-02	Unknown	AI, PH	14:19	14:52	Highway 11	46.5490	-79.5903		overcast clouds	10.06						Tributary to Little Tomiko	Sturgeon River	Notman	North Bay	Highways,Forest, Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	12+541	DS ZDA reach 2	12+541	2024-05-02	Unknown	AI	16:07	16:43	Highway 11	46.5537	-79.5971		overcast clouds	14	9.7	140	0	5.95	7.4	Unnamed tributary to Tomiko River	Sturgeon River	Notman	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	12+541	DS ZDA Reach 1	12+541	2024-05-02	Unknown	AI, PH	16:31	16:35	Highway 11	46.5537	-79.5972		overcast clouds	12.01						Unnamed tributary to Tomiko River	Sturgeon River	Notman	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	12+541	US ZDA 0 to 20 m US of culvert	12+541	2024-05-02	Unknown	AI, PH	16:55	17:12	Highway 11	46.5542	-79.5969		overcast clouds	12.01						Unnamed tributary to Tomiko River	Sturgeon River	Notman	North Bay	Highways,Forest

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Describe Surrounding Land Use:	Pollution Sources:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	Wetland	Highway	Open Foot Culvert				Upstream ZDA	Yes	From 0 to 20 m upstream of culvert	Steam_River	Permanent	Up to 20 m from culvert including ROW. Active channel through wetland with water pooling at embankment.	20	Run,Pool	75	0.4	0.6	0.55	0.6	Detritus,Silt,Clay, Muck,Sand					10
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman		Highway	Box Culvert		0.9		DS ZDA reach 2	No	From 35m to 60 m downstream of culvert in ROW	Steam_River	Permanent	From 35 m to 60 m DS of outlet in ROW	25	Run,Pool	40	0.15	11	0.25	12	Gravel,Sand,Silt,M uck,Detritus				5	5
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman		Highway	Box Culvert				DS ZDA reach 1	No	Within ROW 0 to 35 m DS of outler	Channelized	Permanent	Downstream ZDA within ROW 0 to 35 m ds of outlet	35	Run,Flats	20	0.2	4.2	0.35	4.5	Detritus,Muck,Silt					
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman		Highway	Box Culvert				US ZDA	No	0 to 20 m US of culvert	Channelized	Intermittent	US ZDA 0 to 20 m US of culvert	20	Flats											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	25		25	40		25	30	22			Boulder,Sand,Silt,Detritus,Muck	20			15	20	15	25										
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	15		15	60		60	0.15	11	0.25	12	Silt,Muck,Detritus					20	30	50										
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	35		30	35																							
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman																											

Project Number	Project Description	Crossing ID:	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman								80																			
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman								100	0.25	3	0.4	3.2	Silt,Muck,Detritus						20		30	50					

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman								Stable	Stable	Vulnerable Bank	Vulnerable Bank	Undercut_Banks,Organic_Debris,Vascular_Macrophytes,Woody_Debris	25	10			10	30	50	30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman								Stable	Stable	Deposition Zone	Deposition Zone	Organic_Debris,Woody_Debris,Vascular_Macrophytes	50				45	45	10	30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman								Stable	Stable	Protected Bank	Vulnerable Bank	Vascular_Macrophytes,Organic_Debris	90					30	70	1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman								Stable	Stable	Protected Bank	Vulnerable Bank	Vascular_Macrophytes,Organic_Debris	70					30	70	1 to 29

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation(%):	Predominant Emergent Species:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	Some shade providwd by cattail, grasses, shrubs like leathwrleaf, sweet gale, speckled alder.	Submergent,Emergent	20	Grass, algae			80	Grass, sedge, cattail	Yes		Graye and debris is narrowing and blocking inlet, impeding upstream movement with debris and velocity			Remove steel grate from inlet, collecting debris and narrowing channel.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	Feature through forest is shaded by forest trees, but overhanging cover only by a few shrubs.	Emergent					100	Sedges	Yes		Low flow, debris				
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	Provided only by cattails in ditch	Emergent					100	Cattail, sedges	Yes		Low flow				
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	Overhanging cover provided by cattails in ROW. Beyond ROW forest canopy providing shade but not significant overhanging cover.	Emergent					100	Cattail, sedges	Yes		Low flow			Maintain habitat and garbage cleanup	

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 Notman	See other form for water chem etc. Defined channel flowing through wetland, a second less-defined channel converges with the main defined channel. Water pools at embankment. Wetland is approx 90 m wide, saturated but flow is mainly in channels.
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	Low flow collecting in highway ditch with cattails and turning into forest. No defined channel in highway ditch with cattail, but as feature turns in the forest there is a poorly defined flow path through a low lying swamp. Low flow amd may be an impediment in summer conditions but present enough for some substrate sorting and channel formation through saturated swamp area with side pools. DS in ZGA flow is more concentrated into a defined channel through forest. Gradient impediment DS in ZGA, but flows from feature US / east of highway and possibly accessible to fish. Permanent flow is a conservative assumption because of mild channel formation.
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	See other form for culvert, water chem, etc. Also flat and run conditions consistent. Slow flowing with side pockets flowing in ditch choked with cattails, but drains to wetland feature in forest. Sew other reach form for forest.
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+541 Notman	See other for for water chem, culvert, etc. Water feature with low flow and little to no channel formation flowing through forest in swamp similar to DS. Remnants of a beaver dam. Low flow and anticipate very low or dry in summer. Possible connectivity for fish from upstream feature when sufficient flow is present, and suitable fish habitat downstream. Flow as well as surface and highway drainage collects in highway ditch choked with cattail

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman	14+926	Downstream ZDA reach 1, 0 to 25 m DS of culvert	14+926	2024-05-02	Unknown	AI, PH	19:58	20:42	Highway 11	46.5679	-79.6203		overcast clouds	15.07	12	1687	2 mm hh	6.78	9.8	Unnamed tributary to Little Tomiko River	Sturgeon River	Notman	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman	14+926	US ZDA	14+926	2024-05-02	Unknown	AI	20:46	21:04	Highway 11	46.5676	-79.6205		overcast clouds	15.07						Unnamed tributary to Little Tomiko River	Sturgeon River	Notman	North Bay	Industrial,Highways,Forest,Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	15+975	DS ROW	15+975	2024-05-03	Unknown	AI, PH	13:55	14:29	Highway 11 at Sand Dam rd	46.4941	-79.5046		overcast clouds	15	9.9	33.5	2 mm hh	5.85	9.8	Unnamed Tributary to Little Sturgeon River	Sturgeon River	Merrick	North Bay	Highways,Forest, Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	15+975	DS ZDA	15+975	2024-05-03	Unknown	AI, PH	14:42	15:04	Highway 11 at Sand Dam rd	46.4939	-79.5047		overcast clouds	14.22						Unnamed tributary to Little Sturgeon River	Sturgeon River	Merrick	North Bay	Highways,Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	16+035	16+035 DS ROW ZDA	16+035	2024-05-03	Unknown	AI, PH	15:31	16:29	Highway 11 at Sand Dam rd	46.4943	-79.5053		overcast clouds	17	11.1	287.5	0	5.78	9.09	Unnamed tributary to Little Sturgeon River	Sturgeon River	Merrick	North Bay	Highways,Forest, Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	16+035	DS ZDA	16+035	2024-05-03	Unknown	AI, PH	16:15	16:36	Highway 11 at Sand Dam	46.4940	-79.5058		overcast clouds	17.22						Unnamed tributary to Little Sturgeon River	Sturgeon River	Merrick	North Bay	Highways,Forest, Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	16+035	Upstream ROW ZDA	16+035	2024-05-03	Unknown	AI, PH	16:50	17:43	Highway 11 at Sand Dam rd	46.4946	-79.5052		overcast clouds	16.7	12	95.5	0	5.72	9.5	Unnamed tributary to Little Sturgeon River	Sturgeon River	Merrick	North Bay	Highways,Forest, Other

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Describe Surrounding Land Use:	Pollution Sources:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman		Highway	Open Foot Culvert		0.9	0.5	DS ZDA Reach 1	No	0 to 25 m DS of culvert	Steam_River	Permanent	Channel from 0 to 25 m downstream of culvert	25	Run,Pool	90	0.05	0.95	0.1	1.1	Gravel,Sand,Cobble,Bedrock,Silt	5		5	35	45
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman	MTO yard and carcass dump site	Highway	Other	See other form, open foot culvert centreline. Sideroad culvert is 0.75 csp	0.75		US ZDA	No	0 to 20 m upstream of culvert within ROW	Channelized	Permanent	From 0 to 20 m upstream of centrelone culvert inlet i cluding sideroad culvert	20	Run,Pool	90	0.05	1.4	0.15	1.7	Gravel,Boulder,Sand		20		75	5
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	Wetland, angling, recreation	Highway. Recent spill in feature from highway, spill sock still in water	Open Foot Culvert		8		Downstream ROW ZDA	None	Within ROW, from 0 to 30 m ds of culvert outlet	Channelized	Permanent	Within ROW from 0 to 30 m ds of outlet	30	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	Recreational, angling	Highway	Open Foot Culvert				DS ZDA	No	From 0 to 50 m DS of ROW (from 30 to 80 m DS of culvert)	Channelized	Permanent	ZDA downstream of ROW (see ROW ZDA form)	50	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	Thicket swamp, recreation	Highway	N/A				DS ROW ZDA	No	Within ROW, 70 m length of channel from embankment to edge of ROW	Steam_River	Permanent	ROW DS ZDA, total approx 70 m	70	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	Thicket swamp	Highway	N/A				DS ZDA		From 0 to 50 m DS of edge of ROW	Steam_River	Permanent	Downstream ZDA, from 0 to 50 m ds of edge of ROW	50	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	Wetland	Highway. Spill containment and cleanup still in place from recent spill/collision	N/A				Upstream ROW ZDA	Yes	Channel within ROW, up to confluence with main/dug channel at 15+975	Steam_River	Permanent	Channel within ROW, 60 m from end of channel to confluence	60	Flats											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman	10					5	0.25	0.6	0.5	0.65	Cobble		100															
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman						10	0.3	1.2	0.45	1.4	Boulder	100																
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick																												
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick																												
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick																												
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick																												
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick																												

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick								100	1.1	11	1.1	11	Gravel,Boulder,Sand,Silt,Muck		20		10	30	30		10						
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick								100	1.5	11.5	1.5	11.5	Gravel,Boulder,Silt,Muck,Sand		10		15	45	25		5						
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick								100	1	10.5	1	10.5	Sand,Silt,Muck,Detritus,Gravel				5	15	45		15	20					
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick								100	1.32	10.7	1.35	10.8	Sand,Silt,Muck,Detritus					20	40		10	30					
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick								100	1.68	8	1.58	7.9	Boulder,Sand,Silt,Clay,Muck,Detritus		10			30	40	5	5	10					

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman								Stable	Stable	Vulnerable Bank	Vulnerable Bank	Undercut_Banks,Cobble,Woody_Debris,Vascular_Macrophytes	20	20		35	25		20	60 to 89
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman								Stable	Stable	Protected Bank	Protected Bank	Boulders,Vascular_Macrophytes	30		40				60	1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick								Slightly Unstable	Slightly Unstable	Eroding Bank	Eroding Bank	Boulders,Woody_Debris	25		75		25			30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick								Moderately Unstable	Moderately Unstable	Eroding Bank	Eroding Bank	Boulders,Woody_Debris	15		40		60			30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick								Stable	Stable	Vulnerable Bank	Vulnerable Bank	Woody_Debris,Organic_Debris,Vascular_Macrophytes	25				50	20	30	30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick								Slightly Unstable	Slightly Unstable	Eroding Bank	Vulnerable Bank	Undercut_Banks,Woody_Debris,Organic_Debris,Vascular_Macrophytes	35	5			60	20	15	1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick								Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Woody_Debris,Organic_Debris,Boulders	15		30		50	20		30 to 59

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation(%):	Predominant Emergent Species:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman	Cover provided by riparian grasses and shrubs	Submergent,Emergent	70	Grass, unknown			30	Sedge	Yes	Grade where channel dissipqtes and flows in to cattail wetland. Also 0.25 m drop over woody debris impeding upstream movement				Deposited embankment material observed in channel. Stabilize embankment and general erosion control, garbage cleanup	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman		Emergent					100	Sedges cattails	Yes	Sideroad culvert perched by 0.8 m Rip rap check dam in ditch on upstream side of sideroad culvert	Low flow			Remove barriers including check dam, Erosion and sediment management, Garbage cleanup.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	Riparian speckled alder providing cover along both banks not not across the entire stream. Channel slightly unstable with exposed roots, soils, and bank sloughs.	None							No					Spill socks on water's surface present, unknown if left in place for spill cleanup period or discarded	Banks of fine material with some exposed soils, roots, and bank sloughing observed. Channel bordered by swamp on either side. Dry alder swamp approx 200 m wide in ROW. Water high, at or just above bankfull.
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	Overhanging speckled alder along both banks providing some canopy but not entirely over stream.	None							Yes		Beaver dam downstream of ZDA at confluence with natural channel (from 16+035) impediment but not complete passage barrier				
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	Riparian shrubs overhanging some but canopy not closed	Submergent,Emergent	80	Grasses			20	Sedges	No					Erosional gullies all along highway embankment, eroding into the feature. Stabilize embankment.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick		Emergent					100	Sedges	Yes		Beaver dam downstream impediment but not likely complete barrier for fish	Side backwater flooded bays with sedge hummocks suitable spawning habitat for Northern Pike			
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	Overhanging shrubs and grasses. Speckled alder, meadowsweet, sweet gale.	None							No			Backwater bay off the left bank with sedge hummocks inundated with water. Suitable spawning habitat for Northern Pike.		Garbage cleanup	

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 Notman	Feature continues upstream/south in ditchline choked with cattail. Appears to be connected to 14+476 and possibly accessible to fish from there.
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	Sinuous feature that appears as though was filled in on meander and straightened for the construction of the culvert.
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	See ROW form for water chem, structure info, etc. Eroding banks more prevalent vs ROW section; sloughing and fallen shrubs and roots, exposed soils and roots. Water is high, at or just above bankfull. The thicket swamp along the right bank was dry with sparse isolated pockets of surface water.
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	Same feature as 15+975 but where natural channel was filled in for highway. No crossing structure found, but defined second channel that flows into 15+975. Water high, at or just above bankfull
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	See ROW form for water chem etc
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+035 Merrick	No crossing structure. Natural channel filled in for highway causeway and dug straightened channel made for crossing structure at 15+975

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	15+975	US ROW ZDA	15+975	2024-05-03	Unknown	AI, PH	17:49	18:00	Highway 11 at Sand Dam rd	46.4947	-79.5043		light rain	20.22	10.7	46.5	0	5.7	8.6	Unnamed tributary to Little Sturgeon River	Sturgeon River	Merrick	North Bay	Highways,Commercial,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	15+975	US ZDA	15+975	2024-05-03	Unknown	AI, PH	18:20	18:33	Highway 11 at Sand Dam rd	46.4947	-79.5043		overcast clouds	19.22			0			Unnamed Tributary to Little Sturgeon River	Sturgeon River	Merrick	North Bay	Industrial,Forest,Highways
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman	14+408	Downstream ZDA 0 to 50 m DS of culvert	14+408	2024-05-03	Unknown	AI, PH	19:11	20:13	Highway 11	46.5651	-79.6149		overcast clouds	16.06	9.5	1603	0	6.5	4.4	Unnamed tributary to Tomiko River	Sturgeon River	Notman	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman		South side of highway ditchline ZDA	14+408	2024-05-03	Unknown	AI, PH	20:17	20:34	Highway 11	46.5649	-79.6151		light rain	16.06						Unnamed tributary to Little Tomiko River	Sturgeon River	Notman	North Bay	Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060		West side of Hwy 11	16+060	2024-05-06	Unknown	KC, PH	19:22		16+060 west side of hwy 11	46.5752	-79.6299		Sunny	18	13	412	10mm	6.12	8.77					Highways,Forest, Other

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Describe Surrounding Land Use:	Pollution Sources:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick		Highway, Industrial access road.	Open Foot Culvert		1.5		US ROW ZDA		Within the ROW upstream of the culvert, to access road	Channelized	Permanent	Within the ROW from the culvert inlet up to the outlet of the second road crossing culvert. 20 m	20	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick		Highway	CSP		1.5		Upstream ZDA	No	From 0 to 20 m upstream of ROW/access road crossing	Channelized	Permanent	Upstream ZDA starting at access road inlet upstream 20 m	20	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman		Highway	Open Foot Culvert		1		DS ZDA	No	From 0 to 50 m downstream of culvert, north side of highway	Channelized	Intermittent	Downstream ZDA 0 to 50 m north of culvert	50	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman		Highway	Open Foot Culvert		0.9		South ZDA		0 to 50 m west of culvert in ditchline.	Channelized	Intermittent	Flows westerly in ditch, but does not flow north through the culvert. Standing water flows in opposite directions either side of highway.	50	Flats											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060	Wetland	Runoff from highway	Other	Unable to locate culvert, possibly obscured by boulder bank protection			0-10		Downstream	Channelized	Permanent	Water seeping under boulder bank protrction from highway and flowing from south of crossing towards crossing location	10	Run	100	0.2	1.5	0.18	0.9	Boulder,Sand		40			60

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060																											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick								100	2	11	2.2	11	Boulder,Sand,Silt		20			50	30								
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick								100	1.9	18	1.9	18	Sand,Silt,Boulder		10			60	30								
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman								100	0.15	0.8	0.25	1.3	Sand,Silt,Muck,Detritus					10	40		20	30					
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman								100	0.15	2.2	0.45	3.2	Sand,Silt,Clay,Muck,Detritus,Boulder		10			20	35	5	15	15					
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060																											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick								Stable	Stable	Vulnerable Bank	Vulnerable Bank	Boulders,Woody_Debris	15		60		40			1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick								Slightly Unstable	Slightly Unstable	Eroding Bank	Eroding Bank	Undercut_Banks,Woody_Debris,Boulders	15	20	30		50			1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman								Stable	Stable	Protected Bank	Protected Bank	Boulders,Cobble,Woody_Debris,Organic_Debris,Vascular_Macrophytes	30		20	10	30	40	5	30 to 59
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman								Stable	Slightly Unstable	Deposition Zone	Vulnerable Bank	Vascular_Macrophytes,Organic_Debris,Boulders	80		15			15	70	1 to 29
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060								Stable	Stable	Protected Bank	Deposition Zone	Boulders,Organic_Debris,Vascular_Macrophytes	60		40			10	50	30 to 59

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation(%):	Predominant Emergent Species:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick		None							No					The secondary road crossing culvert is significantly smaller than highway crossing. Evaluate sizing is appropriate.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	Riparian speckled alder and overhanging grasses present, nut in this widened part of channel not providing significant canopy. Some slumping shrubs on bank and erosion but slight, less than DS side.	None							No					Erosion observed at access road. Stabilize embankment, evaluate culvert sizing.	Two 1.5 m CSP with smaller overflow culvert.
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman	Canopy is closed and shaded from adjacent forest. Riparian shrubs more prevalent in ROW (speckled alder), in forest overhanging cover from riparian shrubs more sparse.	None,Emergent					100	Cattails in outlet pool	Yes		Low flow			Garbage cleanup	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman	Only few shrubs on right bank, and cattails providing minimal overhanging cover	Emergent,Submergent	20	Algae, grass, bladderwort			80	Cattail, grass	Yes		Low flow			Garbage cleanup	
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060	Only reason cover isnt higher is because the cattails haven't grown in yet.	Emergent					100	Cattails	Yes	It is possible that the boulders protecting the highway bank have fallen over the culvert, also possible that it is groundwater seepage...too early for indicator species	Low flow		Na	Maintain habitat, improve grade and syabilization on embankment	reach 10-40m Braided channel amongst cattails. Wd 0.19m, bfd 0.19m, ww 0.8m bfw 0.40m, wetted width is larger than bankful width...wetland is flooded. braided channel banks vertical but anchored by cattails, would still call vulnerable. substrate 90% sand 10% clay, overhanging veg is mostly cattails and sedges. morphology 100% run. Some gradient change. reach 40m -60m Braided channels converge. 0.3m change in elevation, possible impediment to fish passage dueing low flow. Wd was 0.41m, bfd was 0.43m, ww 0.52 m, bfw 0.62m.substrate 80% sand 20%boulder. banks vertical, some undercuttimg present. riparian sedges and speckled alder, no in-water veg some root wads and fallen logs creating small (approx 0.2m) changes in elevatio. run riffle pool morphology. 70% run, 20% pool and 10% riffle.

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	See ROW form for chem etc. Water is high and is at or just above bankfull. Access road culverts are nearly completely submerged.
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman	Feature connected by ditch on upstream side to 14+476, feature flows in ditchline westerly to 14+476. On the north side, water flows northerly. Headwater area and features, and highway drainage does not direct uni-directional flow. The channel on the north side also appears to be a man-made dug channel. Straight with remnants of the excavation, directing drainage to confluence to another channel. Steep banks on either side of dug and piled rock
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 Notman	Ditchline flowing west connecting to 14+476 and not through culvert, though flow is also directed north through dug channel on north side of highway. Ditch also connects to culvert at 14+354 that directs surface flow only (no feature) but same ditchline. Access for fish is unknown but suitable conditions to directly support fish.
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060	small bodied fish observed. water flowing from roadside drains and from under boulders at hwy embankment. lots of sand present approx 15m south of channelized feature supporting surface flow from highway. speckled alder, white cedar, cattails, sedges. channel is deeply incized , water is tea coloured and flow is decent. channel banks are vertical

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278			16+278	2024-05-07	Unknown	KC, PH	12:58		16+278	46.5772	-79.6315		few clouds	12.4	5.8	113 4	0	6.07	5.96	Tributary to Elbow Lakw				Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278DS			16+278	2024-05-07	Unknown	KC, PH	13:49		downstrea m 16+278	46.5771	-79.6319		few clouds	14.4	7	256		5.75	6.58	Tributary of Elbow Lake				Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+527			10+527	2024-05-15	Unknown	KC, PH	12:36			46.4976	-79.5124		scattered clouds	9.27								Merrick		
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+950				2024-05-15	Unknown	KC, PH	12:41			46.5002	-79.5161		scattered clouds	9.18								Blythe		Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+246			11+246	2024-05-15	Unknown	KC, PH	12:44			46.5021	-79.5189		scattered clouds	9.07								Blythe		Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+540			11+540	2024-05-15	Unknown	KC, PH	12:49			46.5039	-79.5218		scattered clouds	9.18								Blythe		Highways,Municip al_Roads,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+662			11+662	2024-05-15	Unknown	KC, PH	12:53			46.5047	-79.5227		scattered clouds	9.07								Blythe		
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+576			13+576	2024-05-15	Unknown	KC, PH	12:58			46.5167	-79.5403		scattered clouds	8.93								Blythe		Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+118			16+118	2024-05-15	Unknown	KC, PH	13:04			46.5320	-79.5650		scattered clouds	8.96								Blythe		Highways,Forest

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Describe Surrounding Land Use:	Pollution Sources:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278		Runoff from highway	Box Culvert		1.8	1.5	Upstream		Upstream	Channelized	Permanent	Pool at culvert inlet is at bottom of catchment area. forested area approx 15m us from culvert is at a higher elevation, as is highway drainage causing a bowl shape at the culvert inlet pool.	15	Pool												
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278DS		Runoff from highway	Box Culvert				Downstream		Downstream	Steam_River	Permanent	Culvert outlet mostly blocked by boulder and fallen trees	0 -10	Run,Riffle	70	0.15	1.2	0.3	2	Gravel,Sand,Cobble			10	50	40
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+527																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+950																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+246		Runoff																							
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+540		Runoff	Other	HDPE																					
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+662																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+576		Runoff																							
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+118		Runoff	Box Culvert																						

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278						100	1.1	16	2	18	Detritus,Muck						30	70									
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278DS																				40	0.1	0.9	0.15	1	Cobble,Gravel		
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+527																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+950																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+246																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+540																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+662																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+576																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+118																											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278DS	30	70																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+527																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+950																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+246																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+540																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+662																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+576																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+118																											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278								Stable	Slightly Unstable	Deposition Zone	Vulnerable Bank	Woody_Debris,Undercut_Banks	70	10			90			60 to 89
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278DS								Slightly Unstable	Slightly Unstable	Eroding Bank	Vulnerable Bank	Woody_Debris,Cobble,Undercut_Banks	40	40		10	50			90 to 100
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+527													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+950													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+246													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+540													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+662													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+576													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+118													0							

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation(%):	Predominant Emergent Species:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278	Most of the cover is caused by woody debris overhanging the pool. balsam fir, speckled alder and dead white pines	None							Yes	Unable to see through culvert	Low flow	Na	Na	ensure culvert is clear to remove any possible fish passage barriers	Bowl shaped catchment area balsam fir, speckled alder, balsam poplar, and white pine and strawberry present as riparian vegetation. no in water veg present lots of woody debris in pool
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278DS	Fallen pine trees obscuring culvert outlet and first 5m of watercourse. woody debris in stream causes 0.25m drop.	None							Yes	Boulder and fallen tree obscure most of culvert outlet. sediment build up inside of culvert outlet also restricts flows. water is able to continue to flow downstream however fish passage would likely benefit from from clearing the boulder and fallen trees from outlet.	Low flow			Remove sediment, boulder, and fallen trees from outlet	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+527															
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+950															
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+246															
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+540															
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+662															
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+576															
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+118															

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278	
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278DS	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+527	Approx 2m concrete culvert. NFH, no channel us. goundwater and surface water. hwy drain only. Ds: steep gradient, no access for fish, no feature despite channel. channel us buried in some spots.
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+950	No channel, no feature. surface water only collecting at outlet. NFH
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+246	~2m concrete pipe, permanent flow but only surface water in ditch. channel not defined . DS no substrate sorting and is sub terrianean, deep off steep slope barrier. us is ditch with steep landscape, no feature, ditch only
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+540	hwy drainage, both sides embanked by riprap, no defined channel, grassses growing in ditch, standing water on us side only, likely not fh
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+662	Us side no channel water dissipates in bush and bush is upland. no connection. DS cattails in drain to wetland but no open water, no connection to feature. likely not fish habitat
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+576	Us is surface water collecting in ditch, no feature. DS is super perched approx 6ft over wetland which acts as a grade block impeding fish passage from the wetland upstream
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+118	No feature us- bedrock on other side of highway ditch DS water present but culvert is perched. slope and a pile of riprap. NFH

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668			16+668	2024-05-15	Unknown	KC, PH	13:09			46.5356	-79.5702		scattered clouds	9.6								Blythe		Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+475				2024-05-15	Unknown	KC, PH	13:15			46.5408	-79.5778		scattered clouds	10.97								Notman		Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+976			11+976	2024-05-15	Unknown	KC, PH	13:22			46.5503	-79.5919		scattered clouds	11.08								Notman		
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+763			12+763	2024-05-15	Unknown	KC, PH	13:25			46.5552	-79.5990		scattered clouds	10.99								Notman		
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464				2024-05-15	Unknown	KC, PH	13:29			46.5596	-79.6057		scattered clouds	10.95										
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073			14+073	2024-05-15	Unknown	KC, PH	13:34			46.5632	-79.6115		scattered clouds	10.95								Notman		
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+354			14+354	2024-05-15	Unknown	KC, PH	14:00			46.5648	-79.6144		few clouds	11.08								Notman		Highways,Forest
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926-side culvert			14+926	2024-05-15	Unknown	KC, PH	14:11			46.5675	-79.6206	North Bay	few clouds	11.68								Notman		
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+680			13+680	2024-05-15	Unknown	KC, PH	15:13			46.5612	-79.6080	North Bay	few clouds	13.03								Notman		
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+241			13+241	2024-05-15		KC, PH	15:16			46.5586	-79.6042	North Bay	few clouds	13.95								Notman		

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Describe Surrounding Land Use:	Pollution Sources:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+475																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+976																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+763																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+354																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926-side culvert																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+680																									
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+241																									

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+475																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+976																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+763																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+354																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926-side culvert																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+680																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+241																											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+475																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+976																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+763																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+354																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926-side culvert																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+680																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+241																											

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+475													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+976													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+763													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+354													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926-side culvert													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+680													0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+241													0							

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation(%):	Predominant Emergent Species:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668															
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+475															
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+976															
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+763															
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464															
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073															
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+354															
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926-side culvert															
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+680															
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+241															

Appendix D-1: Watercourse Survey - Spring 2024 Field Notes

Project Number	Project Description	Crossing ID:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668	Us nfh. ditch with surface water. no feature. DS is sort of a channel for 4-5m then there is a sharpe drop. surface water only in ditch
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+475	Indirect/NFH. confined culvert only conveys surface water to the lake below. water dissipates in forest and severe grade barriers. no access for fish from lake to hwy ROW. us confirmed surface and hwy drainage. water collecting in ditch drains from forest. there is no us feature,no access from us
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+976	No feature. upland area. not fish habitat
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+763	hwy drainage. bedrock and upland forest on either side of hwy no connection to ds habitat. Nfh
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464	NFH. check dams on either side of us culvert and bedrock is present on east side on hwy ditch. ds flows into a wetland and there is a steep gradient from wetland to culvert
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073	Fen on either side of hwy. outlet channel appears man made as it is 2m deep with mucky bottom and stops approx 10m ds from culvert. then goes into peat moss fen with some surface water. no connection or channel from fen to lake ds. Upland area seperates fen from lake/wetland system further west. It may overtop and connect during high flow periods. assess during second assessment. probably not fish habitat but worth double checking
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+354	Hwy ditch. HDPE culvert. bedrock on both sides of hwy no possible access nfh
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926-side culvert	us check dams present us of side culvert. water trickling through it to side road culvert. outlet is perched and there is maybe 5m before it crosses the centerline culvert. perch and check dam likely prevent fish from moving us
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+680	Ditch only. bedrock on both side of highway. NFH
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+241	low lying area with cattails. no channel, hwy drainage, no open water

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:	Describe Surrounding Land Use:	Pollution Sources:
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 US			15+975	2024-08-06	Unknown	KC	16:24			46.4946	-79.5041	Trout Mills	broken clouds	20.25	18.4	106.7		6.62	5.14			Merrick		Highways,Forest, Municipal_Roads		Runoff from highway and roads
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe			12+725	2024-08-06	Unknown	KC, PH	19:03			46.5115	-79.5323	North Bay	broken clouds	22								Blythe		Highways,Forest		Runoff from highway
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe DS			12+725	2024-08-06	Unknown	KC	19:47			46.5113	-79.5329	North Bay	broken clouds	21.02	15.3	2801	0	6.2	0.37			Blythe		Highways,Forest, Other	Wetland	Runoff from highway
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 US			13+400	2024-08-07	Unknown	KC, PH	13:24			46.5155	-79.5384	North Bay	scattered clouds	15.88										Highways,Forest		Runoff from highway
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 US			13+928	2024-08-07	Unknown	KC, PH	18:16			46.5191	-79.5436	North Bay	scattered clouds	21.91								Blythe		Highways,Forest		Runoff from hwy

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 US	Open Foot Culvert							Steam_River	Permanent		50	Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe	Other	Concrete pipe			Upstream			Steam_River	Permanent		50	Pool,Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe DS	Other	Concrete pipe			Downstream			Channelized	Permanent		200	Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 US	Other	Concrete pipe			Upstream			Channelized	Intermittent																		
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 US	Open Foot Culvert		2	2				Channelized	Intermittent		20	Pool															

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 US																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe		40	0,6	3,5	0,87	4	Silt,Gravel,Sand, Detritus,Cobble		5	20	10	40		25														
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe DS																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 US																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 US		100	0,02	0,14			Cobble,Boulder,Gravel,Sand	10	40	30	20																

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 US				100	1.75	12	2.25	14	Cobble,Gravel,Sand,Detritus			30	20	45				5									
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe				60	0.15	0.35	0.35	0.35	Sand,Cobble,Gravel,Detritus,Silt			30	30	20	5			15									
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe DS				60	1.1	5	1.3	5.2	Cobble,Muck,Detritus,Gravel,Silt			25	5		10		30	30									
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 US																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 US																											

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation (%):	Predominant Emergent Species:
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 US				Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Undercut_Banks,Cobble	60	20		80				1 to 29	Riparian veg: speckled alder, red osier dogwood, red pine, reed canary grass, queen anne's lace, fireweed.	None,Emergent						5	Water smartweed
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe				Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Cobble	45			100				60 to 89	Riparian veg: speckled alder, golden rod, reed canary grass, cattails, larch, sensitive fern, dark green bullrush, bracken fern, ox eye daisy,	None							
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe DS				Stable	Stable	Protected Bank	Vulnerable Bank	Cobble,Organic_Debris,Woody_Debris	60			40	40	20		30 to 59	Riparian veg: speckled alder, cattails, golden rod, aster, cattails, blue vervain, pearly everlasting, sensitive fern, larch, white meadowsweet, red maple, dark green bullrushes,	Floating				Green-brown algae		
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 US									0															
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 US				Stable	Stable	Protected Bank	Protected Bank	Vascular_Macrophytes, Cobble	85			30			70	90 to 100	Riparian veg: Joe pye weed, marsh fern, sensitive fern, interupted fern, tall white aster, golden rod, sedge spp, speckled alder, cattails, horsetail, eastern white cedar, fire cherry, red raspberry, balsam poplar, black spruce, red maples,	None							

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 US	No			Cleen gravel substrate in culvert, juvenile BT captured,		Remove hydrocarbons, maintain habitat, fix sink hole/erosion of side street	Juvenile Brook Trout captured and released Spill soxx on ds side of culvert and a hydrocarbon stuck to wading boots. Wetted width in front of culvert: 12m, bankful width in front of culvert: 14m channel channel is narrow and deeper approx 10m upstream of highway culvert, Wetted width by side street culvert approx 9m, wetted depth approx 2.0m, bankfull width approx 11m, bankfull depth approx 2.25k. Seine netting was localized to wide area in front of culvert and some fly fishing occurred in the deepers sections. it was too deep to e-fish at the time of assessment.	Side channel conveyed water from hwy ditch on west side of to main channel (north side of hwy) to main channel, comparable wetted depth. Upstream of side street: wetted depth <2.0m, channel morph is flats but there us a point bar 11.0m from the side channel culvert. Wide flat area in just upstream of side st culvert ~20m wide. Channel cuts around a vegetated sandbar and water smartweed is only present in study area by this sand bar
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe	Yes		Boulders present where stream begins to open into a pool may impede some speciesnfrom traveling upstream during low flow conditions	N/a	N/a	Maintain habitat, remove boulder impediments to fish passage	Vertical banks with some evidence of scour presnt once you get upstream into the speckled alder. No flow was observed at the time of assessment. Narrow entrenched channel with a natural meander pattern through alders. Channel opens up to a pool at the culvert inlet, approx 0.6m deep, water present.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	12+725 Blythe DS	Yes	Beaver dam		Na	Na	Remove beaver dam to improve flow,	Check calibration of YSI, conductivity and DO seemed uncharacteristic of fish habitat but central mudminnow and brook stickleback were captured during community assessment. Algae growth suggests that there is little to no flow and lots of nutrients in the system. Confirmed the site is direct fish habitat.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 US								Dry at time of assessment. Catchment/recharge area was dry but cattails were present throughout. Defined channel begins approx 10m before culvert and is very straight. Sphagnum moss growing along channelized bottom. Riparian veg includes: cattails, larch, speckled alder, white pine, eastern white cedar, black spruce, golden rod, tall white asters (growing in moss), st. Johns wort. Boulder and debris obstruction at culvert inlet is restricting flow in culvert. Pooled water approx 0.06m infront of boulder approx 0.02m is flowing into culvert
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 US	Yes	Ditch channel is approx 1.0m higher than culvert inlet. This likely impedes fish passage upstream	No flow in summer	Na	Na	Fix gradient going into culvert	Pockets of shallow water pooled in ditch channel, Water tolerant terrrstrial vegetation is growing throughout ditch channel, no visible flow, culvert wae dry at time of assessment. Feature likely contributes seasonally to watercourse/wetland downstream. Likely indirect habitat	

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:	Describe Surrounding Land Use:	Pollution Sources:
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 DS			13+928	2024-08-07	Unknown	KC	18:35			46.5189	-79.5443		scattered clouds	21.9								Blythe		Forest,Highways		Runoff from highway
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359			14+359	2024-08-07	Unknown	KC, PH	19:25			46.5217	-79.5477	North Bay	overcast clouds	22.89								Blythe		Highways,Forest		Runoff from hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 DS			14+359	2024-08-07	Unknown	KC	19:39			46.5216	-79.5479	North Bay	overcast clouds	22.89								Blythe		Forest,Highways		Runoff from hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 US			15+512	2024-08-08	Unknown	KC, PH	13:46			46.5284	-79.5591	North Bay	overcast clouds	16.89								Blythe		Highways,Forest		Runoff from hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS			15+512	2024-08-08	Unknown	KC, PH	14:19			46.5284	-79.5597	North Bay	overcast clouds	17.05	17.7	403.5	0	5.94	9.26					Highways,Forest		Runoff from highway

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 DS	Open Foot Culvert				Downstream			Channelized	Intermittent		150	Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359	Box Culvert				Upstream			Channelized	Intermittent		15	Pool															
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 DS	Box Culvert				Downstream			Channelized	Intermittent		50	Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 US	Open Foot Culvert		1,2	0,8	Upstream			Channelized	Permanent		50	Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS	Open Foot Culvert				Downstream			Channelized	Permanent		200	Flats															

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 DS																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359		100	0.15	1.45	0.2	1.5	Muck,Silt,Gravel			10		30	40														
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 DS																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 US																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS																											

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 DS				100	0.06	0.65	0.23	0.7	Cobble,Detritus,Gravel,Silt ,Muck			35	10		5		5	45									
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 DS				100	0.04	0.5	0.16	0.75	Muck,Detritus,Silt						30		40	30									
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 US				100	0.07	1	0.15	1.2	Cobble,Gravel,Boulder		10	20	70														
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS					0.35	4	0.35	3.5	Muck,Detritus								70	30									

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation (%):	Predominant Emergent Species:
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 DS				Stable	Stable	Protected Bank	Protected Bank	Cobble,Woody_Debris,Vascular_Macrophytes	65			40	50		10	90 to 100	Riparian: cattails, sarsasporillia, starflower, Canada Yew, rock polypody, white cedar, balsam fir, sugar maple, yellow birch, sensitive fern, sedge, bracken fern, grasses	Emergent						10	Cattails
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359				Stable	Stable	Deposition Zone	Deposition Zone	None	0							30 to 59	Riparian veg: wild parsnip, speckled alder, interuppted fern, joe pye weed, carex spp, black spruce, black ash, eastern white, red maple, ox eye daisy, yellow hawkweed, evening primrose, blue bead lily, sedges, cattails							
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 DS				Stable	Stable	Deposition Zone	Deposition Zone	Woody_Debris,Organic_Debris,Vascular_Macrophytes	60				30	30	40	60 to 89	Riparian veg: interupted fern, bunch berries, twin flowers, balsam fir, speckled alder, mountain maple, eastern white cedar, starflower, grasses, carex spp, cattails, bullrushes, joe pye weed,	None,Emergent						40	Cattails, bullrushes
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 US				Stable	Stable	Protected Bank	Protected Bank	Woody_Debris,Cobble	60			60	40			60 to 89	Riparian veg: eastern white cedar, blue spruce, sweet gale, speckled alder, golden rod, white aster, white meadow sweet, leather leaf, grasses, balsam fir, white birch, strawberry, large leaf aster,	None							
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS				Stable	Stable	Deposition Zone	Deposition Zone	Vascular_Macrophytes, Woody_Debris	85				40		60	1 to 29	Riparian veg: larch, cattails, meadowsweet, leatherleaf, bracken ferns, sweet gale, carex spp., sheet laurel, soft stemmed bullrush, dark green bullrush, st. Johns wort	Emergent						100	Pond lily, cattails, bullrushes, bog cranberry, carex spp.

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+928 DS	Yes	Gradient	Low flow, woody debris	Na	Unsure if orange substance in water is a type algae or iron deposit or pollution. Same with the sheen on the water surface	Add fish ladder or similar feature to improve fish passage or fix gradient	Very little water exiting culvert. Approx 0.02m wetted depth in hwy ditch where cattails were domiant. Feature becomes more channelized once watercourse enters the forest. still no visible flow is present. Lots of woody debris jams throughout cobbly channel increase fish passage barriers. Unsure if orange substance in channel is an algae or is iron deposits ornis pollution from highway. Feature dries up approx 100m ds from culvert outlet. Channel loses definition and becomes a shallow depression along the forest floor	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359	Yes		Low flow	Na	Na	Maintain habitat	Plunge pool at culvert inlet was the only wetted portion of the channel at the time of assessment. Sedges and ferns growing through ditch suggest that it is dry for the majority of the summer. May contribute seasonally to fish habitat downstream	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+359 DS	Yes		Low flow	Na		Invasive plant management (purple loostrife)	Shallow straight channel from culvert dries up approx 50 m ds and becomes a depression in the forest floor. Orange coloured substance found throughout channel, unsure if it is a type of alge, or iron deposits, or pollution. No signs of erosion on banks, no visible flow, potentially seasonal connectivity downstream. Likely indirect fish habitat	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 US	Yes		Low flow, rock and woody debris jam may impede fish passage	Na	Iron staining on rocks	Remove debris build up Maintain habitat	Channelized feature conveys flows from upstream wetland to culvert. Hwy drainage ditch is approximately 1.2m higher than the top of bank in the feature. Feature is quite straight fnd uniform in width/depth suggesting that it may have been dredged. Some cobbles/gravels form a slight break in the channel approx 1.0m upstream from cukvert. Water still present us from this rock barrier and a similar depth to the water at the culvert inlet. Iron staining present on cobbles in this rock break.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS	No			Na	Na	Maintain habitat	Channelized feature conveys flows from culvert to ponded area that seems to be part of a bog. Banks were overtopped at time of assessment and water was present in sedge grassy dominanted area.	

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:	Describe Surrounding Land Use:	Pollution Sources:
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668			16+668	2024-08-08	Unknown	KC, PH	16:57			46.5354	-79.5703	North Bay	overcast clouds	23.12								Blythe		Highways,Forest		Runoff from highway
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 US			10+072	2024-08-08	Unknown	KC, PH	17:31			46.5382	-79.5739	North Bay	overcast clouds	25.13								Notman		Highways,Forest		Runoff from highway
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 0-50m			10+072	2024-08-08	Unknown	KC, PH	18:37			46.5378	-79.5745		overcast clouds	26.7								Notman		Highways,Forest		Highway
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US			10+881	2024-08-09	Unknown	KC, PH	14:03			46.5431	-79.5817	North Bay	overcast clouds	21.12	19.1	1715.64		5.64	2.03			Notman		Highways,Forest, Other	Wetland	Runoff from highway

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668	Open Foot Culvert		0.9	0.5	Downstream			Channelized	Intermittent			Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 US	Open Foot Culvert		0.9	1				Channelized	Intermittent			Culvert															
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 0-50m	Open Foot Culvert				Downstream			Channelized	Intermittent		50	Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	Open Foot Culvert				Upstream			Steam_River	Permanent		50	Flats															

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 US																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 0-50m																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US																											

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668					0.03	1.5	0.1	2.5	Cobble,Gravel,Muck,Detritus,Boulder		10	15	15				30	30									
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 US																				0.01	0.3	0.3	0.75	Cobble,Sand,Boulder,Gravel,Detritus		5	30
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 0-50m				10	0.2	0.25	0.5	0.2	Boulder,Sand,Gravel,Detritus		5		25	40				30									
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US					1.05	20	0.9	17	Cobble,Gravel,Sand,Muck			20	30	5			25										

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation (%):	Predominant Emergent Species:
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668				Stable		Protected Bank	Protected Bank	Cobble,Organic_Debris,Vascular_Macrophytes	60			60		10	30	30 to 59	Riparian: cattails, queen annes lace, white aster, golden rod, white pine, frindge brome, smooth brome, eastern white cedar, balsam firs, red maple, trembling aspen, white birch, balsam poplar, sensitive fern, marsh fern, pearly everlasting, raspberry, horsetail, bullrush	Emergent						100	Cattails, bullrush
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 US	30	30	25	Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Woody_Debris,Cobble,Boulders,Undercut_Banks	70	10	20	30	40			90 to 100	Eastern white cedar, raspberry, yellow birch, sensitive fern, white aster, golden rod, balsam fir, pin cherry, speckled alder, interuptted fern, jewelweed, red maple,	None						
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 0-50m				Moderately Unstable	Moderately Unstable	Eroding Bank	Eroding Bank	Undercut_Banks,Woody_Debris,Boulders	60	60	10		30			30 to 59	Approx 60% cover Ripairan: bullrushes, cattails, reed canary grass, water iris, sweet gale. Forest ripairan: sarsasporillia, balsam firx yellow birch, red maple, white pine, Canada Yew, sensitive fern, marsh fern, ostrich fern red oak, black ash, eastern white cedar	None						
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US				Slightly Unstable	Stable	Vulnerable Bank	Deposition Zone	Cobble,Vascular_Macrophytes,Woody_Debris	75			15	25		60	30 to 59	Riparian veg: speckled alder, sweet gale, golden rod, asters, bullrushes, cattails, white meadowsweet, jewelweed , American bullweed, reed canary grass, fireweed	Emergent						100	Water smartweed, white pond lily, cattails, sedges spp,

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+668	Yes	gradient		Na	Iron staining	Cleanup garbage, stabilize highway embankment, erosion present on side of culvert	Sueface flow from forest upstream and hwy drainage is conveyed through the culvert. water flows down presumably channelized feature (consistent width and is straight throughout) and through forest. No flow observed at time of assessment, sheen and iron staining in present water could be either a sign of groundwater inputs or pollution. Erosion on highway embankment may start to undermind gaurd rail post if not addressed. Water present for first 30m after the culvert and then feature becomes dry and undefined. During high flow events its likely that water from this culvert is conveyed 5 to the lake via sheet/surface flow. Feature likely contrinutes to fish habitta further downstream/downhill from embankment butnit is unlikely that the feature at the culvert is fish habitat.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 US	Yes		Dry at time of assessment	Na	Na	Repair culvert footing	Highway drainage ditch is conveyed to culvert at low point in valley. Some water pooled at culvert inlet but was otherwise dry. Ditch is confined by hwy embankment and upland forest. Likely contributes to fish habitat downstream	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+072 DS 0-50m	Yes	Change in elevation is approx 1.75m from the channel by culvert to where the bottom of the embankment where channel becomes defined again	Dry for 10 m approx 25m downstream of culvert.		Na	Remove iron stained debris from culvert Maintain downstream habitat	Water present for approx 25m ds of culvert. Two elevation drops cause permanent barriers to fish passage. Erosion present throughout channelized system. After second elevation drop channel loses definition and gravel and sand are washed out along forest floor for approx 10m. This along with the exposed roots and leaf/debris little caught on some of the lower branches suggest that water likely flows quickly through this section of forest during high flow events (i.e. spring freshet). The Sarsasporillia growing through these gravel/sand deposits at time of assessment support the theory that there is only seasonal flow in this location. Channel becomes defined again approx 40m ds from culvert, once feature exits forest, and is defiend right to lake. Small bodied fish observed in channel withbdirect connectivity to lake. Lower secrion is fish habitat, culvert section likely indirect habitat	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	Yes	Beaver dam was higher than it was during spring assessment and water was not trickling through it. Water was trickling through alder thicket to get to the culvert.		Na	Na	Remove beaver dam to restore flows downstream. Maintain habitat	Beaver dam impeding flow downstream. Avg depth within 10m immediately upstream of culvert but downstream of beaver dam was approx 0.1m and wetted width was approx 4m. Small bodied fish observed by culvert.	

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:	Describe Surrounding Land Use:	Pollution Sources:
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS			10+881	2024-08-09	Unknown	KC, PH	15:45			46.5433	-79.5814		overcast clouds	26	18.3	270.5		5.8	1.2			Notman		Highways,Forest		Runoff from hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+430			11+430	2024-08-12	Unknown	PH, BS	12:42	12:48	Hwy 11 N	46.5468	-79.5865	North Bay	overcast clouds	12.28						Unknown	Little sturgeon	Notman	North Bay	Commercial,Highways,Forest,Other	Wetland	Hwy pollution
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS			11+800	2024-08-12	Unknown	PH, BS	12:57	13:17	Hwy 11 N	46.5490	-79.5899	North Bay	overcast clouds	12.34	15.7	125		6.45	4.55	Unnamed	Little Sturgeon River	Notman	North Bay	Highways,Forest, Other	Wetland	Hwy pollution
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US			11+800	2024-08-12	Unknown	PH	13:19	13:40	Hwy 11 N	46.5490	-79.5901	North Bay	overcast clouds	12.28						Unnamed	Little sturgeon river	Notman	North Bay	Highways,Forest, Other	Wetland	Hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464			13+464	2024-08-12	Unknown	PH, BS	15:54	16:00		46.5597	-79.6056	North Bay	broken clouds	19.55	19.6	811		7.98	8.11	Unnamed	Little sturgeon River	Notman	North Bay	Highways,Forest, Other	Wetaland swamp DS	Hwy, Snowplow turning and Grabage site

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	Open Foot Culvert				Downstream			Channelized	Permanent		200	Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+430	Open Foot Culvert		0.9	1					Intermittent	Water retention area in a wetland, no defined channels, water pooling in the culvert(10cm) but no conection upstream or downstream. Cattail marshe and cedar swamp downstream. Mature birch/maple forest upstream. May be seasonal fish habitat.																	
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	Open Foot Culvert		0.9	1.3	50m DS	Flowing through	0 to 50m ds of crossing	Channelized	Permanent		50.00	Run,Flats	50	0.1	1.1	0.3	1.3	Cobble,Boulder,Gravel,Sand,Detritus		5	45	30	10				10
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	Open Foot Culvert		0.9	1.3	25m US			Steam_River		Finger chanbbel		Run,Flats,Pool	40	0.11	0.9	0.3	1.2	Silt,Boulder,Muck,Detritus,Cobble		5	20			35		30	30
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464					50M US			Channelized	Ephemeral	Man made hwy ditch runs parralell to hwy, one check dam(riprap)		Flats															

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+430																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	100																										
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	100	20	0.7	5	0.9	5.5	Muck,Detritus,Silt ,Cobble		20			40	30	30	100												
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464																											

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS				100	0.83	4.5	1.13	4.6	Boulder,Cobble,Gravel,Clay,Detritus,Sand		15	30	20	15		10		10									
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+430																												
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS				50	0.15	1.2	0.4	1.4	Cobble,Boulder,Gravel,Detritus,Muck		5	45	30				15	5	100								
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US				40	0.5	0.6	0.75	0.9	Sand,Cobble,Silt,Muck			15		25	40		40		100								
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464				100	25	2.5	0.5	4	Cobble			100															

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation (%):	Predominant Emergent Species:
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS				Unstable	Unstable	Eroding Bank	Eroding Bank	Undercut_Banks,Cobble,Woody_Debris,Vascular_Macrophytes	60	50		30	10		10	30 to 59	Riparian: steeple bush, white meadowsweet, speckled alder, broadleaved cattail, canada goldenrod, carex spp., st johns wort, leather leaf, sweet gale, black spruce, larch, smooth brome, grass spp	Emergent					100	Cattails, pond lily, watersmartweed,
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+430									0															
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS				Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Undercut_Banks,Boulders,Cobble, Woody_Debris,Vascular_Macrophytes	80	10	15	45	15		15	60 to 89	Cattail marsh, raparian includes speckled alder, tall white meadowsweet, flattop white aster, broadleaf cattails, sensitive fern, canada golden rod,	Emergent					70	Broafleaf cattails.
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US				Slightly Unstable	Slightly Unstable	Deposition Zone	Deposition Zone	Undercut_Banks,Cobble,Boulders, Vascular_Macrophytes	60	20	20	30			30	1 to 29	Cattail marsh with some floating mats Riparian: cattails, st johns worth, speckled alder, smooth brome, tall withe meadowsweet, joepie weed, clubhead bullrush, canada golden rod, flat top white asters	Emergent,Floating,Submergent	50	Canada water weed	20	Algae	30	Dark green bull rush , cattails,
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464				Stable	Stable	Protected Bank	Protected Bank	Cobble,Vascular_Macrophytes	50			80			20	None	Hwy embankmemt, and forest within righg of way. Sensitive fern, black spruce, purple loosestrife, phrag, larch, pearly everlasting, speckled alder	None						

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	Yes		Beaver dam	Na	Na	Stabilize banks, clean up road washout, maintain habitat	Around 0.4m undercuts on banks. Channelized feature consistent depth and width throughout reach. Small bodied fish observed. Some overflownat culvert outlwt possibly created from beaver dam.	
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+430						Maintain habitat		
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	Yes		Low flow			Maitain habitat, cukvert concrete is falling appart, exposed rebar.		
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	No					Culvert inlet is crumbling, exposed rebar amd metal grid in the stream. Maintain habitat		Stream splits into multiple channels at the inlet, deeper pool on the north side of tge crossing. Shallower pool/flat on the southside of the split. Both channels flows.trhough a speckeled alders swamp.
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464	Yes	Check dam (riprap)						

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:	Describe Surrounding Land Use:	Pollution Sources:
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073 DS			14+073	2024-08-12	Unknown	PH, BS	17:40		Hwy 11 N	46.5631	-79.6116	North Bay	broken clouds	20.98	20.4	6947		6.55	13.55	Unnamed	Little Sturgeon River	Nottmam	North Bay	Highways,Forest, Other	Wetland (larch swamp)	Hwy drainage
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS			14+408	2024-08-12	Unknown	PH, BS	18:16	18:28		46.5648	-79.6151	North Bay	broken clouds	21.8	18.4	5224		7.74	11.8	Unnamed	Little Sturgeon River	Notman	North Bay	Highways,Forest		Hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 DS			14+926	2024-08-12	Unknown	PH, BS	18:52	19:07		46.5678	-79.6203	North Bay	few clouds	23.44						Unnamed	Little Sturgeon River	Notman	North Bay	Highways,Forest		Hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 US			14+926	2024-08-12	Unknown	PH, BS	19:12	19:16		46.5678	-79.6203	North Bay	few clouds	23.44						Unnamed	Little Sturgeon River	Notman	North Bay	Highways,Forest		Hwy

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073 DS	Open Foot Culvert		0.9	1.3	DS			Channelized	Permanent	Hwy ditch conveying water at outlet. Channelized stream going into the larch swamp (~30m) from hwy. Channel dissapear in the swamp. Where channel meet ditvhes, water is stagnant. Channel completely dry US with rip rap check dam at the inlet.	30	Pool,Flats																
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS	Open Foot Culvert		0.9	1.1	DS Drainage ditch			Channelized	Intermittent	Water collect in yhe hwy ditch at oulet amd doesnt flow anywhere due to low water conditions. US inlet is dry, and ditches are also dry ~ 8m both side of the outlet.	15.00	Flats																
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 DS	Open Foot Culvert		0.9	0.9	DS			Channelized	Intermittent	Visible channel that is dry. Few pockets of standing water within the channel. Culvert is dry.																	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 US	Open Foot Culvert		0.9	0.9	US			Channelized	Intermittent	Perched side culvert 5m from inlet. Small pool under thr side culvert (10cm water) but the chanel to the inlet is dry. DS culvert is dry. Define chanel conveying water from hwy drainage during high flow condition. Same.conditions as spring but now water.	6																

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073 DS		50	1.5	7	1.8	8	Muck,Detritus						50	50	100												
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 DS																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 US																											

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073 DS					1.2	1.5	1.7	1.8	Muck,Detritus								50	50	100								
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS				100	0.25	4	0.75	5	Bedrock,Cobble,Muck,Detritus,Silt,Sand	5		15		25	30		10	15	100								
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 DS																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 US																											

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation (%):	Predominant Emergent Species:
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073 DS				Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Vascular_Macrophytes, Organic_Debris,Woody_Debris	50				20	50	30	30 to 59	Man made channel and hwy drainage ditch. Riparian: cattails, larch, speckeled alder, flattop white aster, red raspberry, reed canary grass, fireweed, bullrush sp, sensitive fern, canada golden rod, black spruce	Emergent,Floating			25	Algae	30	Cattails, bullrusj sp.
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS				Slightly Unstable	Slightly Unstable	Protected Bank	Vulnerable Bank	Vascular_Macrophytes	60						60	1 to 29	Bedrock and embankment from hwy, Sphagnum,moss, braken fern red maple, larch, golden rod,	Floating,Emergent			40	Algae	25	Cattails
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 DS									0															
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 US									0															

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+073 DS								Small bodied fish observed
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS	Yes		Low flowmai			Maintain habitat, cintrol erosion from.hwy embankement	Small bodied fish observed in the culvert	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 DS							Likely seasonal fish habitat, gravel beds,	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+926 US								

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Station ID:	Section Name or Description	MTO Chainage:	Survey Date:	Is stream realignment required?	Survey Collectors:	Time Started:	Time Finished:	Location of Crossing:	Latitude	Longitude	Location	Weather Conditions	Air Temperature (°C):	Water Temperature (°C):	Conductivity (µS/cm):	Water Velocity:	Water pH Level:	Dissolved Oxygen (mg/L):	Name of Watercourse:	Drainage System:	Township:	MNR District:	Surrounding Land Use:	Describe Surrounding Land Use:	Pollution Sources:
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (West)			16+060	2024-08-13	Unknown	PH, BS	15:01	15:14		46.5754	-79.6306				17.2	703		6.54	3.3	Unnamed trib to Elbow lake	Little sturgeon River	Notman	North Bay	Forest,Highways		Hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US			16+278	2024-08-13	No	PH, BS	18:00	18:09		46.5772	-79.6314		Clear sky no wind	25	14	94.3	0	6.3	6.68	Unnamed tributary to Elbow Lake	Little Sturgeon River	Notman	North Bay	Highways,Forest		Hwy
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 DS			16+278	2024-08-13	Unknown	PH, BS	18:37	18:42		46.5770	-79.6318									Unnamed tributary to Elbow lake	Little sturgeon river	Notman	North Bay	Highways,Forest		Hwy

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Existing Structure Type:	Describe Existing Structure Type:	Existing Structure Width (m):	Existing Structure Height (m):	Section (Reach) Identifier:	Associated Wetland:	Section Location:	Section Type:	Section Type Status:	Section Type Description:	Section Length (m):	Subsection Types	Run - Percentage of area:	Run - Mean wetted depth (m):	Run - Mean wetted width (m):	Run - Mean bankful depth (m):	Run - Mean bankful width (m):	Run - Substrate Type:	Run - Bedrock Substrate %	Run - Boulder Substrate %	Run - Cobble Substrate %	Run - Gravel Substrate %	Run - Sand Substrate %	Run - Silt Substrate %	Run - Clay Substrate %	Run - Muck Substrate %	Run - Detritus Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (West)	N/A				0m to 70m DS			Steam_River	Permanent	Channel orginating from under the boulders of the hwy embankment. Finger channels flowing through mineral cattail marsh(0m to 20m) . low flow resulting in multiples channels being dry and one main channel conveying water. Multiple debris jam and low water(shallow section that are dry) cause seasonal obstruction to fish passage. 20m and beyond, the channel widen and deepen into an alder thicket (mineral thicket). Define channel with undercut banks and woody debris creating cover for fish. 100% flats with varying depth and slight meander.	70.00	Flats															
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US	Open Foot Culvert		3	1.5	US			Channelized	Permanent	Water collection/recharge area at mouth of culvert. No visible input. Pool approx 6m ×6m.	6	Pool																
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 DS	Open Foot Culvert				DS			Steam_River	Permanent	Culvert outlet burried preventin water from US to flow DS. Define channel with little water present due to obstruction. Channel is covered by fallem trees and vegetation.	50	Flats																

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Run - Total Substrate %:	Pool - Percentage of area:	Pool - Mean wetted depth (m):	Pool - Mean wetted width (m):	Pool - Mean bankful depth (m):	Pool - Mean bankful width (m):	Pool - Substrate Type:	Pool - Boulder Substrate %	Pool - Cobble Substrate %	Pool - Gravel Substrate %	Pool - Sand Substrate %	Pool - Silt Substrate %	Pool - Muck Substrate %	Pool - Detritus Substrate %	Pool - Total Substrate %:	Riffle - Percentage of Area:	Riffle - Mean wetted depth (m):	Riffle - Mean wetted width (m):	Riffle - Mean bankful depth (m):	Riffle - Mean bankful width (m):	Riffle - Substrate Type:	Riffle - Bedrock Substrate %	Riffle - Boulder Substrate %	Riffle - Cobble Substrate %	Riffle - Gravel Substrate %	Riffle - Sand Substrate %	Riffle - Silt Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (West)																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US		100	1.6	6	2	8	Sand,Silt,Muck				60	20	20		100												
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 DS																											

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Riffle - Muck Substrate %	Riffle - Detritus Substrate %	Riffle - Total Substrate %	Flats - Percentage of Area:	Flats - Mean wetted depth (m):	Flats - Mean wetted width (m):	Flats - Mean bankful depth (m):	Flats - Mean bankful width (m):	Flats - Substrate Type:	Flats - Bedrock Substrate %	Flats - Boulder Substrate %	Flats - Cobble Substrate %	Flats - Gravel Substrate %	Flats - Sand Substrate %	Flats - Silt Substrate %	Flats - Clay Substrate %	Flats - Muck Substrate %	Flats - Detritus Substrate %	Flats - Total Substrate %:	Culvert - Mean wetted depth (m):	Culvert - Mean wetted width (m):	Culvert - Mean bankful depth (m):	Culvert - Mean bankful width (m):	Culvert - Substrate Type:	Culvert - Bedrock Substrate %	Culvert - Boulder Substrate %	Culvert - Cobble Substrate %
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (West)				100	0.4	1.2	0.6	1.45	Sand,Silt,Detritus					60	30			10	100								
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US																											
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 DS				100	5	0.5	0.75	3	Cobble,Detritus,Boulder,Gravel,Sand,Silt		5	20	20	10	15			30	100								

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Culvert - Gravel Substrate %	Culvert - Sand Substrate %	Culvert - Detritus Substrate %	Left Bank Stability:	Right Bank Stability:	Left Bank Description:	Right Bank Description:	Sources of in-stream cover:	Total In-stream Cover %:	Undercut Banks In-stream Cover %:	Boulder In-stream Cover %:	Cobble In-stream Cover %:	Woody Debris In-Stream Cover %:	Organic Debris In-stream Cover %:	Vascular Macrophytes In-stream Cover %:	Total Overhanging Cover (%):	Shore Cover Comments:	Vegetation Types Present:	Submergent Vegetation (%):	Predominant Submergent Species:	Floating Vegetation (%):	Predominant Floating Species:	Emergent Vegetation (%):	Predominant Emergent Species:
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (West)				Moderately Unstable	Moderately Unstable	Vulnerable Bank	Vulnerable Bank	Undercut_Banks,Woody_Debris,Organic_Debris	60	50			25	25		60 to 89	Cattail mineral marsh 0m to 20m with joepy weed, jewel weed, golden rod, canada mint, sensitive ferns, speckled alder. 20m to 70m is alder thicket with same riparian.	Emergent						25	Cattails
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US				Slightly Unstable	Slightly Unstable	Vulnerable Bank	Vulnerable Bank	Woody_Debris,Organic_Debris,Vascular_Macrophytes	75				20	40	40	30 to 59	Speckled alder falling in to the pool, uprooted trees, dead falls in the pool. Riparian: speckled alder, sensitibe ferns, black spruce, balsam fir, canada mint, field strawberry, spagnum moss	Submergent	40	Algeae				
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 DS				Moderately Unstable	Moderately Unstable	Vulnerable Bank	Vulnerable Bank	Boulders,Cobble,Woody_Debris,Organic_Debris,Undercut_Banks	80	5	15	30	40	10		30 to 59	Riparian: speckled alder, red maple, balsam fir, black spruce, skunk current, mountain maple, marsh fern, white birch. Lots of deadfall over the channel.	None						

Appendix D-1: Watercourse Survey - Summer 2024 Field Notes

Project Number	Project Description	Crossing ID:	Migratory Obstructions Found:	Permanent Obstructions:	Seasonal Obstructions:	Spawning Critical Habitat:	Groundwater Indicators Observed:	Potential Enhancement Opportunities:	Additional Comments:	Comments or Additional Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (West)	Yes		Debris jam, low flow and dry section.			Maintain habitat		
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US	No					Sand substrate is origunating from hwy embankment. Erosion mitigation measure.		
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 DS	Yes	Burried outlet of the culver by boulders from the hwy embankment. Restricting flow from upstream to downstream. Water stays in the culvert with minimal flow to downstream.	Low flow downsstream and shallow (dry section) due to burried outlet			Reinstate flow and clear burried oulet, maintain habitat.		

Appendix D-2: Lakes and Ponds Survey - Spring 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Time Started:	Time Finished:	Weater Conditions:	Air Temp (°C):	Surface Conditions :	Water Surface Condition:	Name of Waterbody:	Station ID:	Location of Station:	Section Name or Description	Latitude	Longitude	MTO Chainage:	Township:	MNR District:	Surrounding Land Use or Terrain:	Describe Surrounding Land Use:	Sources of Pollution	Waterbody Type
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-04-30	AI, PH	13+400 Blythe	13:49	14:19	overcast clouds	11	Calm, vegetated hummocks	Calm	Unnamed tributary to Little Sturgeon River	13+400	North of Sand Dam rd	DS ZDA reach 2	46.5156	-79.5393	13+400	Blythe	North Bay	Highways,Forest, Other	Wetland	Highway	Pond,Wetland
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-06	KC	16+060	18:16		few clouds	15.31	Calm, little wind	Calm	Little Sturgeon River		East side of highway		46.5755	-79.6291	16+060			Highways,Forest		Runoff from highway	Small_Lake
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-01	AI, PH	10+881 Notman	17:24	17:50	light rain	11	Calm	Calm	Tributary to Little Tomiko River	10+881	Highway 11	Upstream ZDA, reach 2 in beaver pond, from 10 to 20 m US of culvert	46.5432	-79.5817	10+881	Notman	North Bay	Highways,Forest, Other	Wetland	Highway	Pond
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-02	AI, PH	14+926 Notman	20:12	20:23	overcast clouds	13.4	Calm, cattail wetland	Calm	Unnamed tributary/online wetland to Little Tomiko River	14+926	Highway 11	Downstream ZDA reach 1 25 to 50 m DS of culvert	46.5680	-79.6201	14+926	Notman	North Bay	Highways,Forest, Other	Wetland	Highway	Wetland

Appendix D-2: Lakes and Ponds Survey - Spring 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Waterbody Type Description	Waterbody Morphology	Waterbody Morphology Description	Waterbody Length (m)	Waterbody Mean Width (m)	Water Colour:	Specify Other Colour:	pH Level:	Surface Conductivity (µS/cm):	Bottom Conductivity (µS/cm):	Water Temp (°C) at 0.0m	Dissolved Oxygen (mg/L) at 0.0m	Water Temp (°C) at 0.5m	Dissolved Oxygen (mg/L) at 0.5m	Maximum Depth (m):	Bottom Substrate Types:	Total Bottom Substrate %	Shoreline Substrate - Boulder (%)	Shoreline Substrate - Cobble (%)	Shoreline Substrate - Gravel (%)
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-04-30	AI, PH	13+400 Blythe	Online dammed watercourse/beaver pond adjacent to the highway embankment on the west side	Permanent	Mostly pools and flats in wetland and impounded water above beaver dams. Small section of run riffle only where water is spilling over dam.		35	Yellow_Brown										1.25	Detritus,Muck,Silt,Sand,Boulder,Gravel		10		5
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-06	KC	16+060	Long skinny lake	Permanent		300	120	Yellow_Brown		6.07		522			13.5	4.26		Detritus,Muck,Silt				
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-01	AI, PH	10+881 Notman	Beaver pond. Watercourse is dammed, above dam is impounded water, open water for approx 25 m. Above pondnis wetland with shrubby hummocks throughout with active channel input into pond.	Permanent	Standing water/flats in pond and input channel	25	21	Yellow_Brown										Detritus,Muck,Silt,Sand				
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-02	AI, PH	14+926 Notman	Cattail marsh in ZDA and treed fen beyond	Permanent	Mostly standing water in wetland choked with cattail	130	35	Yellow_Brown										Silt,Muck,Detritus				

Appendix D-2: Lakes and Ponds Survey - Spring 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Shoreline Substrate - Sand (%)	Shoreline Substrate - Silt (%)	Shoreline Substrate - Muck (%)	Shoreline Substrate - Detritus (%)	Bottom Substrate Comments or Description	Sources of Bank Cover:	Total Bank Cover:	Bank Cover - Boulders:	Bank Cover - Cobbles:	Bank Cover - Woody Debris:	Bank Cover - Organic Debris:	Bank Cover - Vascular Macrophytes:	Bank Cover Comments or Description	Near Shore Slope (%):	Shoreline Substrate Types:	Total Shoreline Substrate (%)	Shoreline Substrate - Bedrock (%)	Shoreline Substrate - Boulder (%)	Shoreline Substrate - Cobble (%)
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-04-30	AI, PH	13+400 Blythe	25	30	10	20	Shoreline is the road embankment, so comprised mainly of blast rock with finer material at toe of slope. Substrate in pond is finer but relatively solid. Opposite/west bank is bedrock and fine material (sand/silt).	Boulders,Woody_Debris, Organic_Debris	40	40		50	10		Embankment blast rock and trees, shrubs. Shrubby hummocks of leatherleaf. Moving south and north increase in tree shoreline cover as feature veers away from highway.		Boulder,Gravel ,Sand			70	
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-06	KC	16+060		20	20	60		Boulders,Cobble,Woody _Debris,Vascular_Macro phytes	5	20	30	20		50	Left bank (when facing away from highway) is flooded, lots of water tolerant shrubs starting to bud out. boulders and cobbles present on highway embankment with eastern white cedar and Balsam fir, speckled alder, sweet gale in riparian		Boulder,Muck, Detritus	100		40	
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-01	AI, PH	10+881 Notman	15	20	30	35	Substrate finer and softer around pond edges and floating mats of veg	Woody_Debris,Vascular _Macrophytes	20			50		50	Mats of leatherleaf, speckled alder, sweet gale, grass providing some edge cover	0	Detritus,Silt,Sa nd				
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-02	AI, PH	14+926 Notman		30	30	40									See underwater cover. No real shoreline or bank, channel flowing to cattail wetland, bordered by fen and forest						

Appendix D-2: Lakes and Ponds Survey - Spring 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Shoreline Substrate - Gravel (%)	Shoreline Substrate - Sand (%)	Shoreline Substrate - Silt (%)	Shoreline Substrate - Muck (%)	Shoreline Substrate - Marl (%)	Shoreline Substrate - Detritus (%)	Shore Cover (% shaded):	Sources of Underwater Cover:	Underwater Cover - Total (%)	Underwater Cover - Boulders (%)	Underwater Cover - Cobbles (%)	Underwater Cover - Woody Debris (%)	Underwater Cover - Organic Debris (%)	Underwater Cover - Vascular Macrophytes (%)	Vegetation Types Found	Vegetation Type - Submerged (%)	Predominant species of submerged vegetation:	Vegetation Type - Floating (%)	Predominant species of floating vegetation:
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-04-30	AI, PH	13+400 Blythe	15	15					30 to 59	Boulders,Woody_Debris,Organic_Debris, Vascular_Macrophytes	40	15		20	30	35	Emergent,Submerged	20	Grasses		
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-06	KC	16+060				20		40	1 to 29	Organic_Debris,Woody_Debris,Boulders, Vascular_Macrophytes	75	15		40	15	30	Submerged,Emergent,Floating	30	Algae,	20	Green algae, brown algae
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-01	AI, PH	10+881 Notman		80	10			10	1 to 29	Woody_Debris,Organic_Debris,Vascular_Macrophytes,Boulders	25	5		15	20	60	Emergent,Submerged	30	Grasses sedges		
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-02	AI, PH	14+926 Notman							30 to 59	Organic_Debris,Woody_Debris,Vascular_Macrophytes	90			10	20	70	Emergent				

Appendix D-2: Lakes and Ponds Survey - Spring 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Vegetation Type - Emergent (%)	Predominant species of emergent vegetation:	Seasonal Migratory Obstructions:	Permanent Migratory Obstructions:	Potential Critical Habitat:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-04-30	AI, PH	13+400 Blythe	80	Cattails, sedges, grasses	Beaver dams. Impediment but may not entirely restrict.			Maintain habitat	Online system flowing southerly along highway embankment, dammed by beavers. Assessment area 35 m wide feature and up to 30 m north and south of culvert. Too shallow for secchi or DO profile. See other reach for water chem.
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-06	KC	16+060	50	Reed canary grass, sweet gale	Low flow	Unable to find a culvert to connect pond to west side of highway	Suitable spawning and nursery habitat for many spring spawning species such as N. pike		Skinny oval-ish shaped lake that ends at the highway embankment, wetted depth off of embankment was approx 1.25 m. Bank is flooded for approx 15 m on north shore and flooded depth was avg 0.45m. a little early for aquatic veg growth but could already see that some was coming back. around 15m a 45 degree angle slope is present. water tea coloured but you can see through it. submerged trees and occasional boulders provide most of underwater cover off of banked area. substrate very soft, can see lots of organic matter. small bodied fish observed. white pine is present approx 20m inland fromedge of bank suggesting that the water level doesnt get much higher on the north shore than it currently is. also ot appears to be suitable wood turtle habitat
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-01	AI, PH	10+881 Notman	70	Sedges, cattails	Beaver dam			Maintain habitat	Open wayer pond is approx 25 x 21 m but wetland complet is extensive. Same wetland as previous crossings to the south. Wetland 50 m across in ZDA. Too shallow for secchi and DO. See watercourse form for second reach below dam.
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-05-02	AI, PH	14+926 Notman	100	Choked with cattail	Low flow in wetland	Gradient where channel flows to wetland prevents upstream movement		Garbage cleanup	See watercourse form for other details. Channel flows and dissipates down a slope and trickles into cattail marsh that is then bordered by treet fen/conifer swamp

Appendix D-2: Lakes and Ponds Survey - Summer 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Time Started:	Time Finished:	Weater Conditions:	Air Temp (°C):	Surface Conditions:	Water Surface Condition:	Name of Waterbody:	Station ID:	Location of Station:	Section Name or Description	Latitude	Longitude	MTO Chainage:	Township:	MNR District:	Surrounding Land Use or Terrain:	Describe Surrounding Land Use:	Sources of Pollution	Waterbody Type	Waterbody Type Description	Waterbody Morphology
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-07	KC	13+400	14:17		scattered clouds	17.8		Calm					46.5154	-79.5392	13+400	Blythe		Highways,Forest, Other	Fen	Runoff from highway	Wetland,Pond	Pond caused by beaver dam	Permanent
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-08	KC	10+072 - 51-200m	18:02		overcast clouds	25.1		Calm					46.5378	-79.5748	10+072 - 51-200m			Forest,Highways		Runoff from highway	Wetland,Small_Lake		Permanent,In_Stream
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-13	PH, BS	16+060 Pond	13:14	13:24	Sunny day, no wind clear skies	19	Calm, mirror like	Calm	Unnamed pond		Hwy 11 N	Pond	46.5753	-79.6291	16+060	Nottman	North Bay	Highways,Forest		Hwy	Pond	Small pond with in put stream but no visible out put	Permanent

Appendix D-2: Lakes and Ponds Survey - Summer 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Waterbody Morphology Description	Waterbody Length (m)	Waterbody Mean Width (m)	Water Colour:	Specify Other Colour:	pH Level:	Surface Conductivity (µS/cm):	Bottom Conductivity (µS/cm):	Water Temp (°C) at 0.0m	Dissolved Oxygen (mg/L) at 0.0m	Water Temp (°C) at 0.5m	Dissolved Oxygen (mg/L) at 0.5m	Maximum Depth (m):	Bottom Substrate Types:	Total Bottom Substrate %	Shoreline Substrate - Boulder (%)	Shoreline Substrate - Cobble (%)	Shoreline Substrate - Gravel (%)	Shoreline Substrate - Sand (%)	Shoreline Substrate - Silt (%)	Shoreline Substrate - Muck (%)
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-07	KC	13+400		76	41	Yellow_Brown		5.25	103.2		18.3	0.47				Gravel,Cobble,Sand,Silt, Boulder,Detritus		10	20	20	15	10	
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-08	KC	10+072 - 51-200m		360	113	Yellow_Brown		6.04	1016		19.8	4.6											
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-13	PH, BS	16+060 Pond	Boulders scattered everywhetr with dead stumps and fallen tree. Muck is covering the bottom. Emergent watersmart weed, arrowhead, softstem	171	85	Colourless		7	750		18.6	6.67				Boulder,Muck,Cobble	100	30	30				70

Appendix D-2: Lakes and Ponds Survey - Summer 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Shoreline Substrate - Detritus (%)	Bottom Substrate Comments or Description	Sources of Bank Cover:	Total Bank Cover:	Bank Cover - Boulders:	Bank Cover - Cobbles:	Bank Cover - Woody Debris:	Bank Cover - Organic Debris:	Bank Cover - Vascular Macrophytes:	Bank Cover Comments or Description	Near Shore Slope (%):	Shoreline Substrate Types:	Total Shoreline Substrate (%)	Shoreline Substrate - Bedrock (%)	Shoreline Substrate - Boulder (%)	Shoreline Substrate - Cobble (%)	Shoreline Substrate - Gravel (%)	Shoreline Substrate - Sand (%)	Shoreline Substrate - Muck (%)	Shoreline Substrate - Marl (%)
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-07	KC	13+400	25	Channelized area immediately ds of culvert is predominately sand gravel substrate and is 0.45m deeper than rest of ponded area. Channel wetted depth was 1.15m, ponded depth was 0.75m and the predominate substrate was muck and boulder in ponded area.	Vascular_Macrophytes,Cobble	35		40			60	Riparian vegetation: bull rush, sweet gale, white meadow sweet, reed canary grass, goldenrod, white pine, larch, black spruce, tall white aster, red maples, leatherleaf,	70	Boulder,Bedrock,Cobble,Gravel,Sand		10	30	40	15	5		
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-08	KC	10+072 - 51-200m		Too deep to wade out to get bottom substrate	Vascular_Macrophytes,Woody_Debris	60			30		70		25	Marl,Detritus,Muck							30	30
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-13	PH, BS	16+060 Pond		~50cm of muck covering a hard bottom comprised of blouders, dead stumps submerveng vegetatiom, emergent vegetation.	Boulders,Woody_Debris, Vascular_Macrophytes	100	40		30		30	Bloudets from hwy embankment and fallem trees. Shrubs and forest community edging the pond.		Boulder,Muck,Detritus	100		50				35	

Appendix D-2: Lakes and Ponds Survey - Summer 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Shoreline Substrate - Detritus (%)	Shore Cover (% shaded):	Sources of Underwater Cover:	Underwater Cover - Total (%)	Underwater Cover - Boulders (%)	Underwater Cover - Cobbles (%)	Underwater Cover - Woody Debris (%)	Underwater Cover - Organic Debris (%)	Underwater Cover - Vascular Macrophytes (%)	Vegetation Types Found	Vegetation Type - Submerged (%)	Predominant species of submerged vegetation:	Vegetation Type - Emergent (%)	Predominant species of emergent vegetation:	Seasonal Migratory Obstructions:	Permanent Migratory Obstructions:	Potential Critical Habitat:
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-07	KC	13+400		1 to 29	Vascular_Macrophytes,Woody_Debris,Boulders,Cobble	70	15	15	30		40	Emergent			100	Cattails, bullrushes, reed canary grass, leather leaf, sweet gale (both wetland plants present along flooded banks)		Beaver dam	
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-08	KC	10+072 - 51-200m	30	30 to 59	Organic_Debris,Woody_Debris,Vascular_Macrophytes,Cobble	85		10	20	10	60	Submerged, Emergent	30	Pond weed	70	Bullrushes, reed canary grass, water iris, cattails, white water lily		Elevation gradient upstream likely a barrier	Wetland area could be suitable pike spawning habitat. Not limited though
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-13	PH, BS	16+060 Pond	15	30 to 59	Boulders,Woody_Debris,Vascular_Macrophytes,Organic_Debris	75	30		30	20	20	Submerged, Emergent	40	Elodea sp	30	Water smartweed, arrowhead, water arrum, soft stem bullrush	Beaver dam at the input source		

Appendix D-2: Lakes and Ponds Survey - Summer 2024 Field Notes

Project Number	Project Description	Date:	Collectors:	Crossing ID:	Potential Enhancement Opportunities:	Additional Comments:
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-07	KC	13+400	Remove culvert obstructions, beaver dam removal would improve connectvity to downstream wetland	Channelized area immedeatly ds of culvert may have been dug out as bottom is fairly square and channel is uniform. Its deeper than rest.of ponded area.
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-08	KC	10+072 - 51-200m	Maintain habitat, retain as much of exisiting trib feature.(including trees and objects that would slow down flow from culvert to lake	Once trib exits woodlot (see watercourse form) area opens up to a wetland with multiple finger channels conveying water to small lake. No obvious flow was observed at time of assessment. Lots of white water lily and grasses growing on lake. Small bodied fish observed swimming in channel. Riparain veg includes: cattail, water iris, bullrush, sweet gale, steeplebush, golden rod, red maple, white pine, eastern white cedar, sedge spp, reed canary grasa. Cattail/sweet gale island in lake
60713279	Highway 11 Improvements (GWP 5151-21-00)	2024-08-13	PH, BS	16+060 Pond	Maintain habitat	

Appendix D-3: Summary of AECOM's 2024 Fish Community Sampling

Project Number	Project Description	Crossing ID	Latitude	Longitude	Survey Date:	Survey Staff:	Time Started:	Time Ended:	Surface Conditions	Air Temp. (°C)	Water Colour:	Name of Waterbody:	Location of Crossing	MTO Chainage:	Township:	MNR District:	Electrofisher Length (m):	Electrofisher Settings:	Electrofisher Seconds:	Nets and Traps Used
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	46.4944	-79.5044	8/6/2024	KC, PH	16:56	18:06	Calm	20.31	Yellow/Brown	Trib to Little Sturgeon River		15+795	Merrick					Other,Seine
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 DS	46.5154	-79.5392	8/7/2024	KC, PH	15:41		Calm	18.93	Yellow/Brown			13+400	Blythe		50	350 volts, frequency: 50 Hz, duty cycle 40	861	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4945	-79.5045	8/7/2024	KC, PH	16:25		Calm	20.31	Yellow/Brown				Merrick					Minnow_Trap
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4946	-79.5041	8/8/2024	KC, PH	20:25	12:37	Calm	15.14	Yellow/Brown				Merrick					Minnow_Trap
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS	46.5284	-79.5597	8/8/2024	KC, PH	15:25		Calm	21.67				15+512	Blythe		50	Volts: 350amps, frequency: 50Hz, duty cycle: 35	460	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817	8/9/2024	KC, PH	15:12		Calm	26	Yellow/Brown			10+881	Notman		50	45Hz, 350 v, 35 duty cycle	731	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	46.5433	-79.5814	8/9/2024	KC, PH	16:30		Calm	27.88				10+881	Notman		20	350 v, 35Hz, duty cycle 35	135	
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	46.5489	-79.5902	8/12/2024	PH, BS	14:36	14:47	Calm	17.71	Yellow/Brown	Unnamed	Hwy 11 N	11+800	Nottman	North Bay	50	250V, 45 Hz, 35DC	230	
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464 US	46.5596	-79.6054	8/12/2024	PH, BS	16:16	16:26	Calm	19.55	Yellow/Brown	Unnamed		13+464	Nottman	North Bay	30	250V, 45Hz, 35DC	175	
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS	46.5648	-79.6151	8/12/2024	PH, BS	18:39	18:49	Calm	23.44	Yellow/Brown	Unnamed		14+408	Nottman	North Bay	10	100V 45Hz, 35DC	145	
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Pond	46.5753	-79.6291	8/12/2024	PH, BS	19:43	13:36	Calm	24.6	Colourless	Unnamed pond		16+060	Nottmam	North Bay				Minnow_Trap
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (west side of Hwy)	46.5754	-79.6306	8/13/2024	PH, BS	15:03	15:19	Calm	28.45		Unnamed trib to Elbow Lake		16+060	Nottman	North Bay	50	250V 35Hz 35 DC	137	
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US	46.5772	-79.6314	8/13/2024	PH, BS	18:18	18:27	Calm		Yellow/Brown	Unnamed tributary of Elbow Lake		16+278	Notman	North Bay	12	250v 35Hz 35DC	127	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975	46.4942	-79.5045	8/20/2024	KC, PH, BS	13:12		Calm	10.89	Yellow/Brown		Sand dam rd upstream		Merrick					Other
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	46.549	-79.5904	8/19/2024	PH, BS	14:21	14:51	Calm	22.08	Yellow/Brown	Unnamed Tributary to Little Tomiko River		11+800	Notman	North Bay	25	150V, 35Hz, 35DC	172	

Appendix D-3: Summary of AECOM's 2024 Fish Community Sampling

Project Number	Project Description	Crossing ID	Latitude	Longitude	Minnow Trap Number:	Minnow Trap Comments:	Seine Comments:	Specify Other:	Other Comments:	Number of Hauls:	Set Time:	Clear Time:	Were Fish Kept:	Comments or Notes
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	46.4944	-79.5044			1.5 hauls of seine net. Channel.too deep for Pat to cross	Fly fish rod	Fly fished for approx 30 min	1			No	See watercourse form for water quailty data.
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 DS	46.5154	-79.5392									No	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4945	-79.5045	2	Two minnow traps set upstream of the hwy crossing					12:25	16:15	No	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4946	-79.5041	2						16:25	8:45	No	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS	46.5284	-79.5597									No	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817									No	
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	46.5433	-79.5814									No	Bottom dropped off suddenly and efisher battery was temporarily submerged
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	46.5489	-79.5902									No	
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464 US	46.5596	-79.6054									No	No fish caught. 15 Mudpuppy caught in the reach. See conota app for pictures
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS	46.5648	-79.6151									No	Conductivity lvl above 5000, efisher had to be use at lowest setting and fish were unbothered. 3 small bodied fish oberserved not reacting to the shock, no ID on the 3 individuals. Most likely connected to each statiom adjacent to 14+408 during high water condition via hwu drainage ditch.
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Pond	46.5753	-79.6291	2	Baited with bread and dog food.					15:45	9:35	No	When setting traps, multiple small bodied fish oberserved over the set traps. Larger creek chub found in one trap had a redbelly dace in its mouth. Might have eaten more then 1 individuals as the trap only had 3 larger creek chub.
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (west side of Hwy)	46.5754	-79.6306									No	Stream was not fishable from.0m to 20m due to dense cattail amd marsh vegetation. Low water made it impossibke to use nets or traps. Efisher was use from 20m to 70m where the channel was deeper (~40cm to 70cm) amd where fish were present.
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US	46.5772	-79.6314									No	
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975	46.4942	-79.5045				Hoop net			9:20	9:15	No	
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	46.549	-79.5904									No	

Appendix D-3: Summary of AECOM's 2024 Fish Community Sampling

Project Number	Project Description	Crossing ID	Latitude	Longitude	Survey Date:	Survey Staff:	Number of Fish Captured:	Was Sample Kept?	Species Scientific/Common Name:	Age Class	Top Predator	Number of fish with blackspot:	Fish Length (mm)	Enter length (mm)
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 Merrick	46.4944	-79.5044	8/6/2024	KC, PH	1	No	Brook Trout	Juvenile	Yes		Total_length	80
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 DS	46.5154	-79.5392	8/7/2024	KC, PH	28	No	Central Mudminnow	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 DS	46.5154	-79.5392	8/7/2024	KC, PH	1	No	White Sucker	Juvenile	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+400 DS	46.5154	-79.5392	8/7/2024	KC, PH	5	No	Brook Stickleback	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4945	-79.5045	8/7/2024	KC, PH		No	White Sucker		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4945	-79.5045	8/7/2024	KC, PH	1	No	Northern Pearl Dace	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4946	-79.5041	8/8/2024	KC, PH	3	No	Northern Pearl Dace	Adult	No	2		
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4946	-79.5041	8/8/2024	KC, PH	1	No	Golden Shiner		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4946	-79.5041	8/8/2024	KC, PH	5	No	Northern Redbelly Dace	Adult	No	1		
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975 DS	46.4946	-79.5041	8/8/2024	KC, PH	1	No	White Sucker		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS	46.5284	-79.5597	8/8/2024	KC, PH	71	No	Central Mudminnow	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+512 DS	46.5284	-79.5597	8/8/2024	KC, PH	3	No	Brook Stickleback	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817	8/9/2024	KC, PH	3	No	Brown bullhead	YOY	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817	8/9/2024	KC, PH	21	No	Central Mudminnow	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817	8/9/2024	KC, PH	4	No	White sucker	Juvenile	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817	8/9/2024	KC, PH	1	No	Luscidae spp.	YOY	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817	8/9/2024	KC, PH	2	No	Brook stickleback	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817	8/9/2024	KC, PH	3	No	Golden Shiner		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 US	46.5431	-79.5817	8/9/2024	KC, PH	2	No	Northern Redbelly Dace	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	46.5433	-79.5814	8/9/2024	KC, PH	36	No	Central mudminnow		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	46.5433	-79.5814	8/9/2024	KC, PH	1	No	Creek chub	Juvenile	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	46.5433	-79.5814	8/9/2024	KC, PH	2	No	Golden shiner	Juvenile	No			

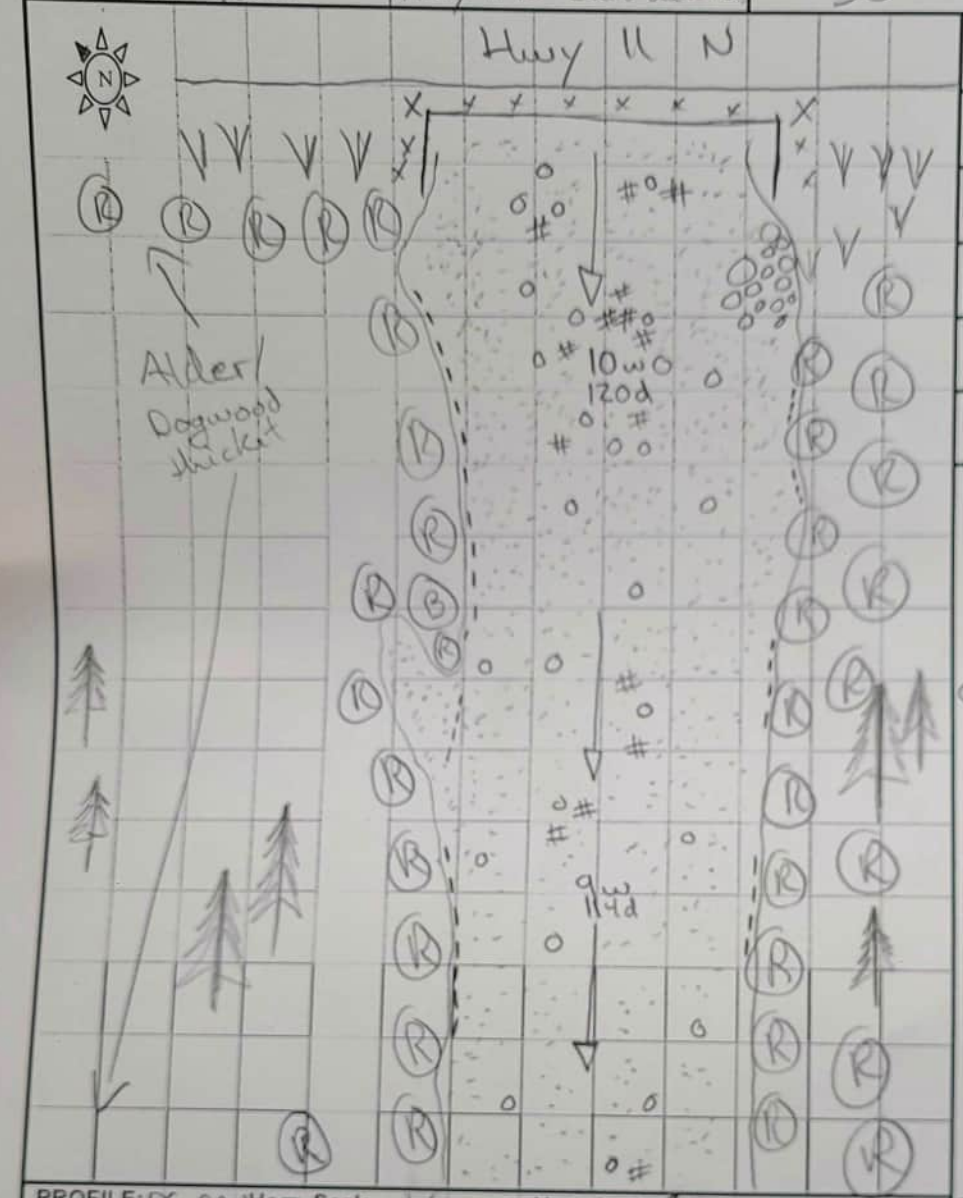
Appendix D-3: Summary of AECOM's 2024 Fish Community Sampling

Project Number	Project Description	Crossing ID	Latitude	Longitude	Survey Date:	Survey Staff:	Number of Fish Captured:	Was Sample Kept?	Species Scientific/Common Name:	Age Class	Top Predator	Number of fish with blackspot:	Fish Length (mm)	Enter length (mm)
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	46.5433	-79.5814	8/9/2024	KC, PH	3		Northern Redbelly Dace	Juvenile	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	10+881 DS	46.5433	-79.5814	8/9/2024	KC, PH	3	No	Chrosomos spp.	YOY	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	46.5489	-79.5902	8/12/2024	PH, BS	64	No	Central Mudminnow	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	46.5489	-79.5902	8/12/2024	PH, BS	11	No	Brook Stickleback	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	46.5489	-79.5902	8/12/2024	PH, BS	9		Red-bellied Dace	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 US	46.5489	-79.5902	8/12/2024	PH, BS	2	No	White sucker	Juvenile	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	13+464 US	46.5596	-79.6054	8/12/2024	PH, BS	0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	14+408 DS	46.5648	-79.6151	8/12/2024	PH, BS	0							
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Pond	46.5753	-79.6291	8/12/2024	PH, BS	28	No	Pearl Dace	Adult	No	5		
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Pond	46.5753	-79.6291	8/12/2024	PH, BS	5	No	Northern Redbelly Dace		No	0		
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Pond	46.5753	-79.6291	8/12/2024	PH, BS	1	No	Finescale × Northern Redbelly Hybrid		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Pond	46.5753	-79.6291	8/12/2024	PH, BS	5	No	Creek chub		No	2		
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Pond	46.5753	-79.6291	8/12/2024	PH, BS	1	No	Brook stickleback		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (west side of Hwy)	46.5754	-79.6306	8/13/2024	PH, BS	1	No	Central mudminnow	Adult	No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (west side of Hwy)	46.5754	-79.6306	8/13/2024	PH, BS	5	No	Finescale × Redbelly Dace hybrid		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (west side of Hwy)	46.5754	-79.6306	8/13/2024	PH, BS	36	No	Pearl dace		No	8		
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (west side of Hwy)	46.5754	-79.6306	8/13/2024	PH, BS	7	No	Northern Redbelly Dace		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+060 Stream (west side of Hwy)	46.5754	-79.6306	8/13/2024	PH, BS	6	No	Creek Chub		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	16+278 US	46.5772	-79.6314	8/13/2024	PH, BS	30	No	Central Mudminnow	Juvenile	No	0		
60713279	Highway 11 Improvements (GWP 5151-21-00)	15+975	46.4942	-79.5045	8/20/2024	KC, PH, BS	1	No	Brook Trout	YOY	Yes		Total_length	75
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	46.549	-79.5904	8/19/2024	PH, BS	64	No	Central Mudminnow		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	46.549	-79.5904	8/19/2024	PH, BS	9	No	Northern Redbelly Dace		No			

Appendix D-3: Summary of AECOM's 2024 Fish Community Sampling

Project Number	Project Description	Crossing ID	Latitude	Longitude	Survey Date:	Survey Staff:	Number of Fish Captured:	Was Sample Kept?	Species Scientific/Common Name:	Age Class	Top Predator	Number of fish with blackspot:	Fish Length (mm)	Enter length (mm)
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	46.549	-79.5904	8/19/2024	PH, BS	11	No	Brook Stickleback		No			
60713279	Highway 11 Improvements (GWP 5151-21-00)	11+800 DS	46.549	-79.5904	8/19/2024	PH, BS	2	No	Creek Chub		No			

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZOA ROW	Hwy 11 N - Sand dam Rd	30	½ V ½ H

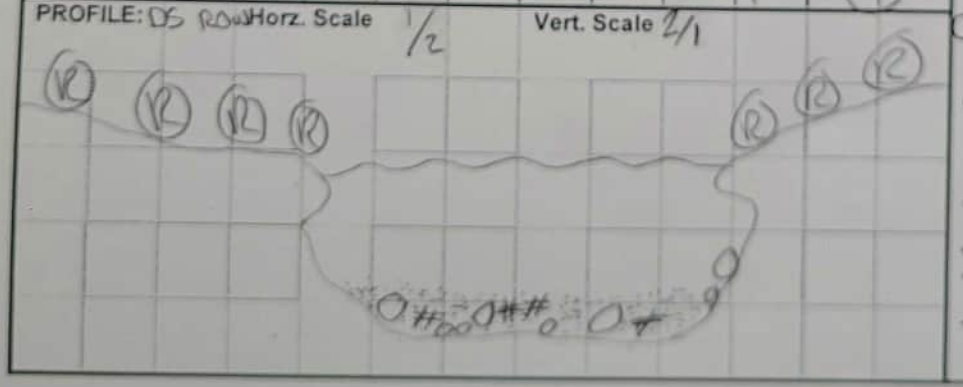


PROJECT #: 60713279
MAPPER: P. Hebert
NAME OF WATERBODY: Unnamed trib. Little Sturgeon
CROSSING #: 15+975 Merrick Trail
STATION #:
DATE: DD-MMM-YY 03-MAY-24

LEGEND

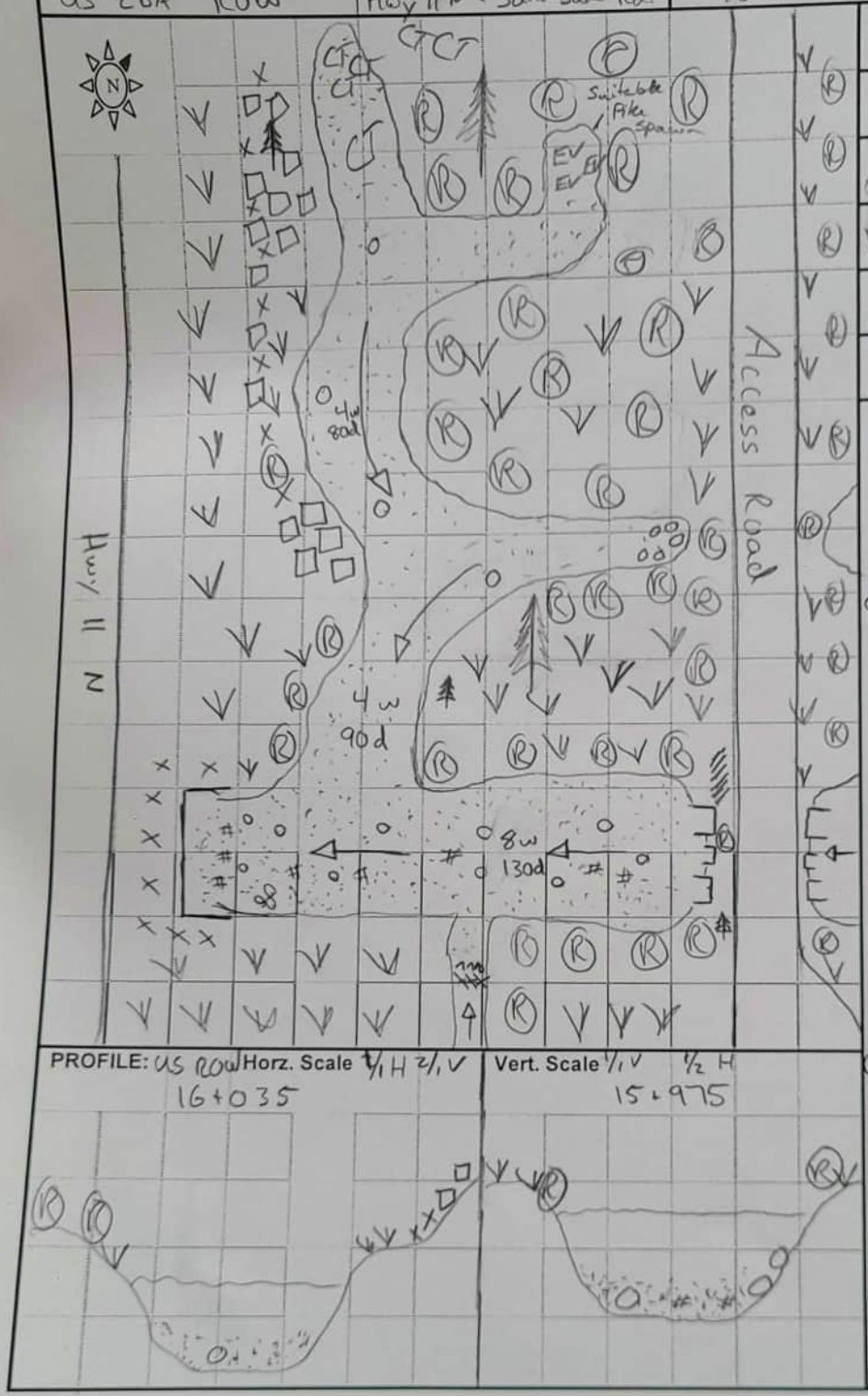
10d depth (cm)
6w width (m)
Riffle
Run/Glide
Pool
Island/Bar
Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** Debris
CT Cattail
SV/FV Submerg/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
/////// Eroded Bank
XXX Riprap / Other Stabilization
Instream Log/Tree
^^^ Dam/Weir/Obstruction
® Riparian Tree
Seep/Spring
------ Undercut Bank
— Barrier to Fish Movement
-S- Seasonal Barrier
-x-x- Fence line
Culvert

PROFILE: DS ROW Horz. Scale 1/2 Vert. Scale 2/1



↑ tree
¥ - herbaceous / grass
□ - large boulder / blast rock
(B) - Beaver hut

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 20A ROW	Hwy 11 N - Sand Dam Rd.	70 m	1/4 V 1/2 H



PROFILE: US ROW Horz. Scale 1/1 H 2/1 V 16+035

Vert. Scale 1/1 V 1/2 H 15+975

PROJECT #:	60713279
MAPPER:	D. Hébert
NAME OF WATERBODY:	Unnamed trib Little Sturgeon
CROSSING #:	15+975 Merrick 16+035 Merrick
STATION #:	
DATE: DD-MMM-YY	03-MAY-24

LEGEND

- **10d** depth (cm)
- **6w** width
- Riffle
- Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- **###** Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- **///////** Eroded Bank
- **XXX** Riprap / Other Stabilization
- Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- **®** Riparian Tree
- Seep/Spring
- **--------** Undercut Bank
- **—** Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- Culvert

tree
- herbaceous / grass
- large boulder / blast rx

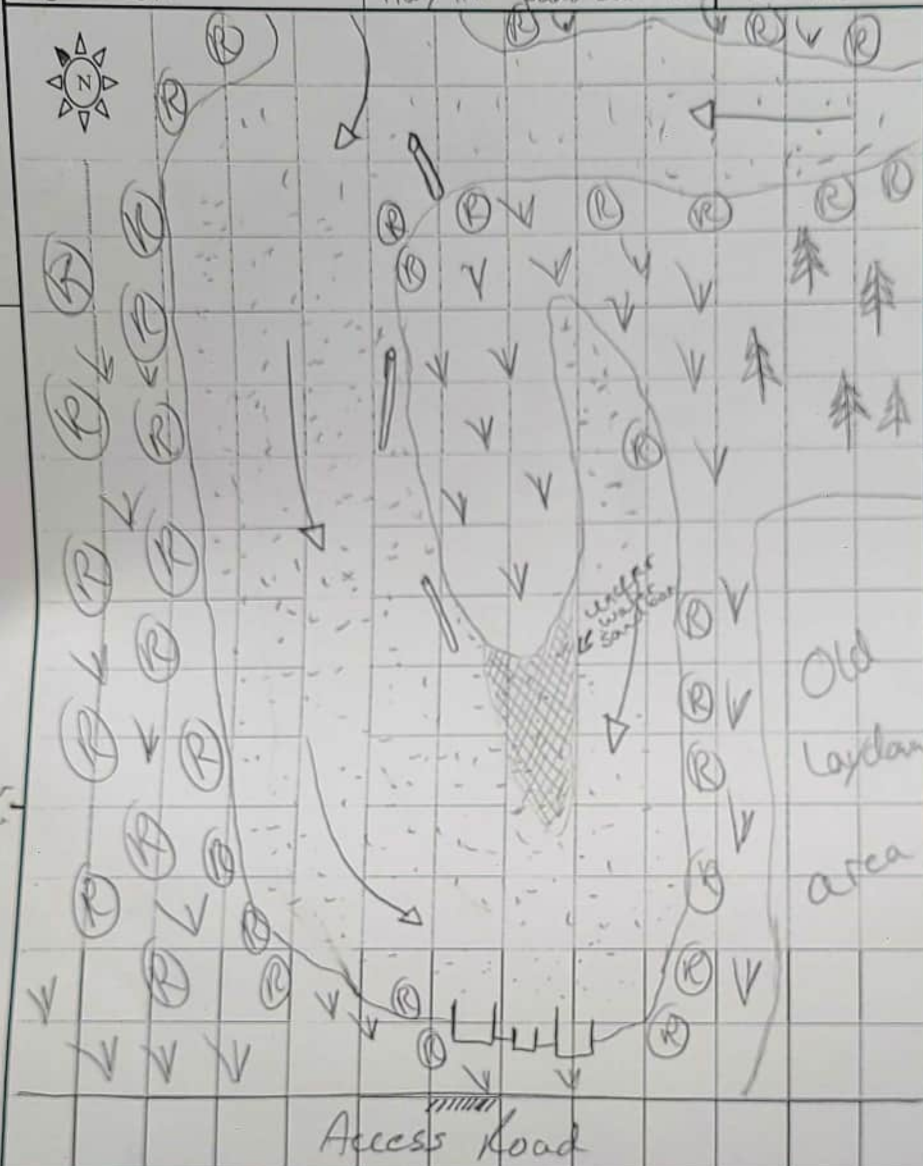
SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US ZDA	Hwy 11N - Sand Dam Rd	20 m	½ V ½ H

GAZ

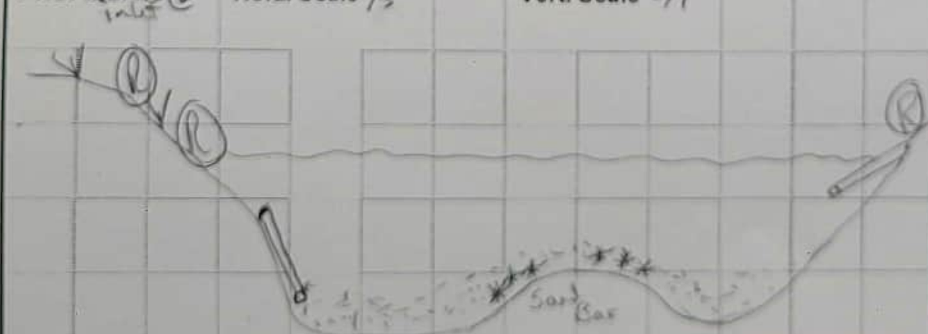
20m

ZDA

Xsection profile



PROFILE: US @ inlet | Horz. Scale 1/3 | Vert. Scale 2/1



PROJECT #: 60713279

MAPPER: P. Hebert

NAME OF WATERBODY: Unnamed trib Little Sturgeon

CROSSING #: 15+975 Merrick

STATION #:

DATE: DD-MMM-YY 03-MAY-24

LEGEND

- 10d depth (cm)
- 6w width
- → Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▓ Island/Bar
- ░ Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- ////// Eroded Bank
- XXX Riprap / Other Stabilization
- ⊂⊃ Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- Ⓡ Riparian Tree
- |► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x-x- Fence line
- └┘ Culvert

↑ tree
V - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZOA ROW	Hwy 11 N - Sand Dam RD	70m ROW	1/3 V 1/3 H

PROJECT #: 60713279

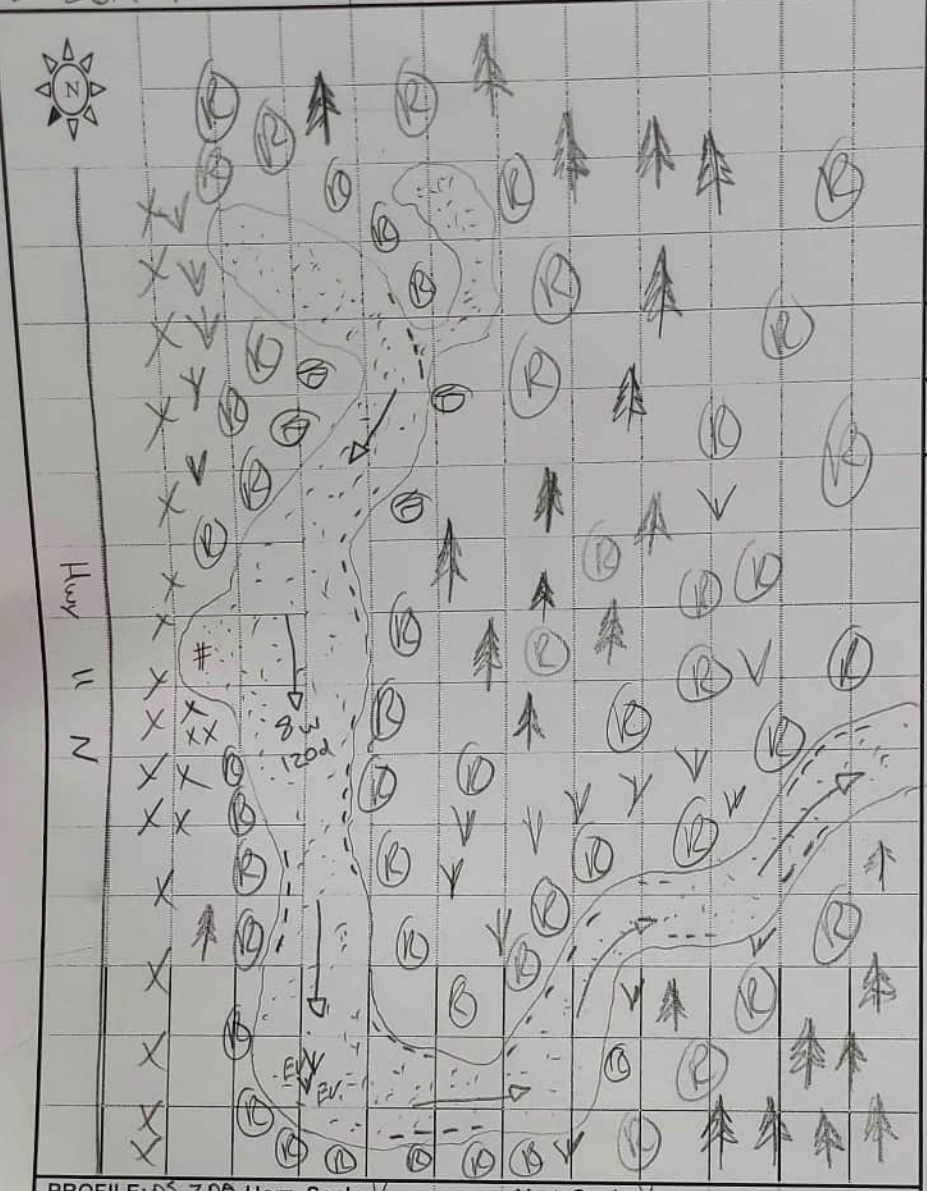
MAPPER: P. Hébert

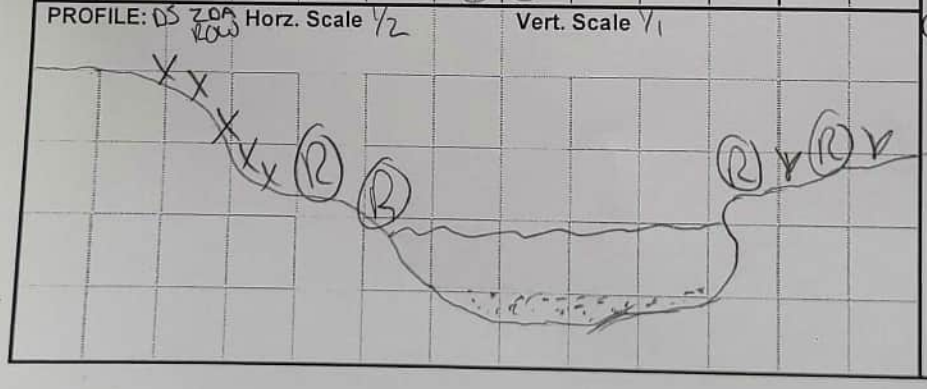
NAME OF WATERBODY: Unnamed trib Little Sturgeon

CROSSING #: 161035 Merrick

STATION #:

DATE: DD-MMM-YY: 03-MAY-24



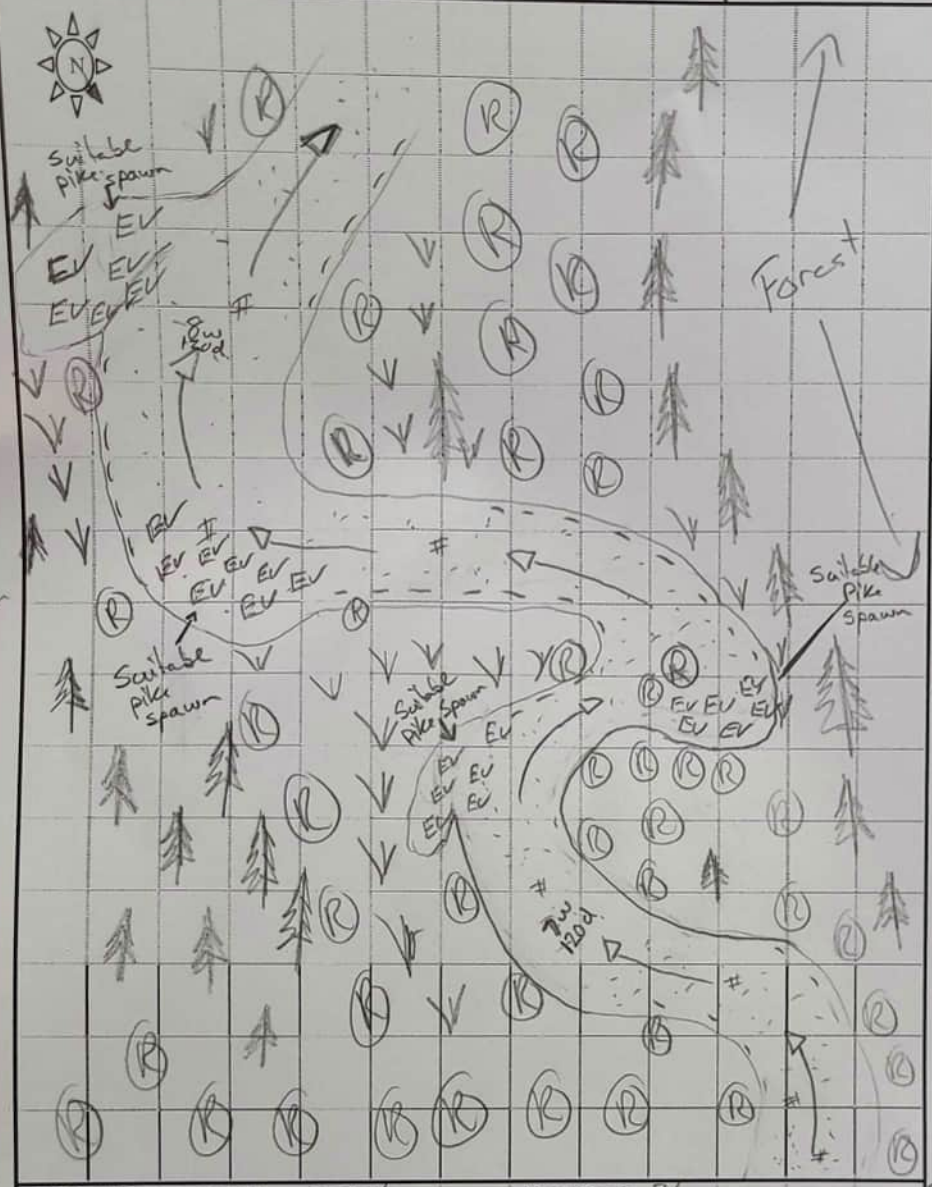


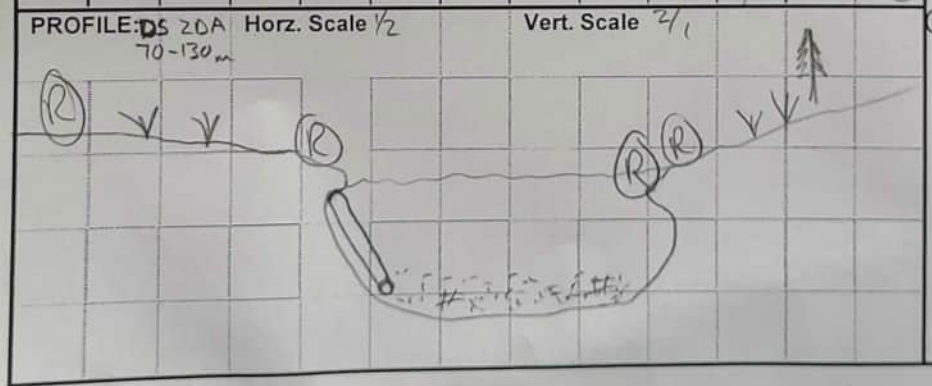
LEGEND

- **10d** depth (cm)
- **6w** width m
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▒ Island/Bar
- ⁘ Fine Substrate
- ### Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- ////// Eroded Bank
- **XXX** Riprap / Other Stabilization
- ⬭ Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- Ⓡ Riparian Tree
- ⊢► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- ⌴ Culvert

↟ tree
Ψ - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZDA 70m - 130m	Hwy 11 N - Sand Dam Rd.	50.	1/3 V 1/3 H





PROJECT #: 607/3279
MAPPER: P. Hébert
NAME OF WATERBODY: Unnamed trib Little Sturgeon
CROSSING #: 16+035 Merrick
STATION #:
DATE: DD-MMM-YY: 03-MAY-24

LEGEND

10d depth (cm)
6w width (m)
➡ Riffle
⇨ Run/Glide
⬭ Pool
▩ Island/Bar
▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** Debris
CT Cattail
SV/FV Submerg/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
/////// Eroded Bank
XXX Riprap / Other Stabilization
⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction
® Riparian Tree
⊢► Seep/Spring
-------- Undercut Bank
— Barrier to Fish Movement
-S- Seasonal Barrier
-x--x- Fence line
⌴ Culvert

↟ tree
¥ - herbaceous / grass
□ - large boulder / blast r

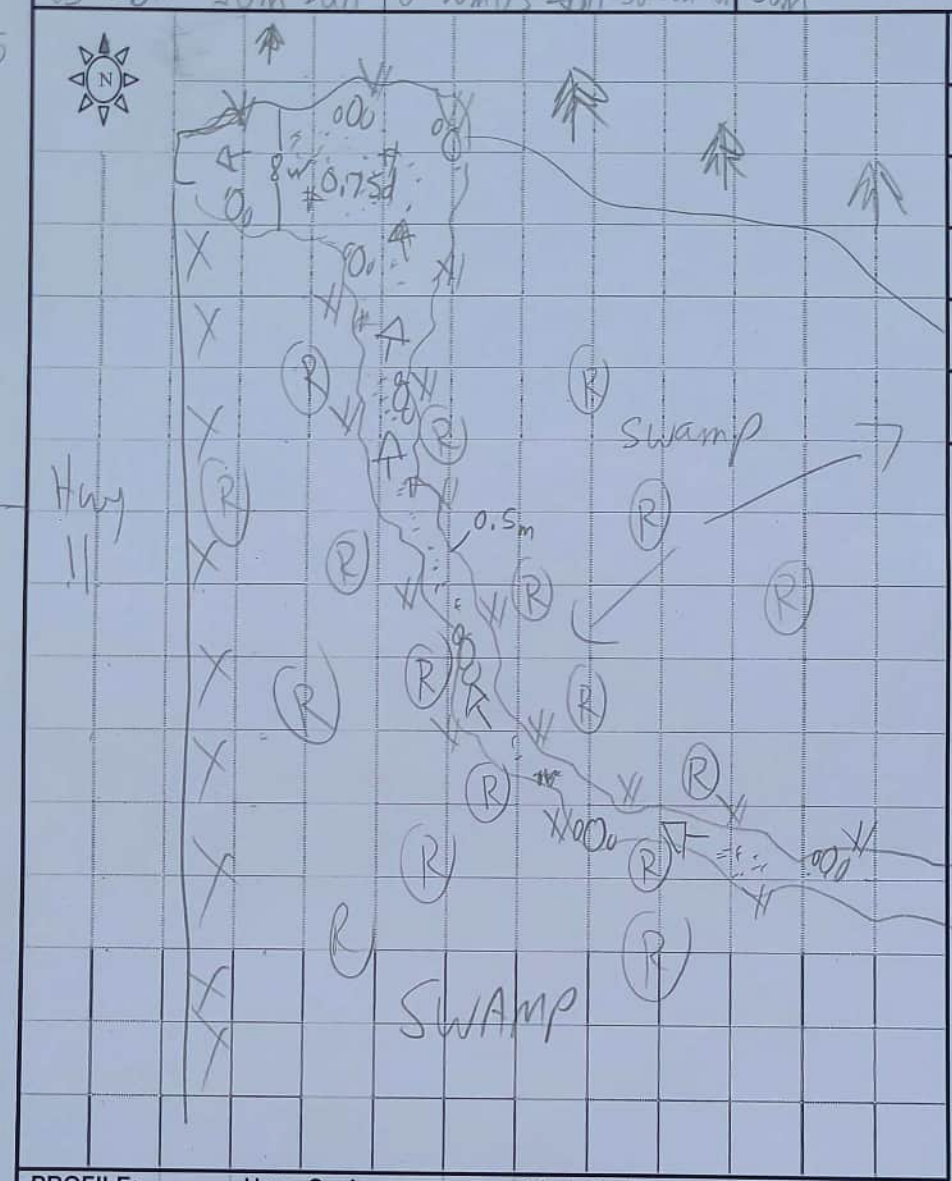
SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 2DA 20m+2GA	0-20m US 2DA 30-50m 2GA	50m	V3V V2H

12+725 US

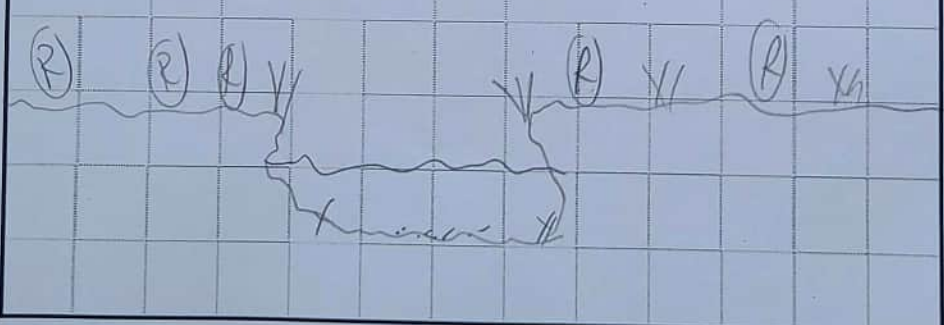
2DA

2GA

V4 V



PROFILE: Horz. Scale Vert. Scale



PROJECT #:	60713279
MAPPER:	A. Imriselli
NAME OF WATERBODY:	Unnamed
CROSSING #:	12+275
STATION #:	
DATE: DD-MMM-YY	29/04/24

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

▒ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

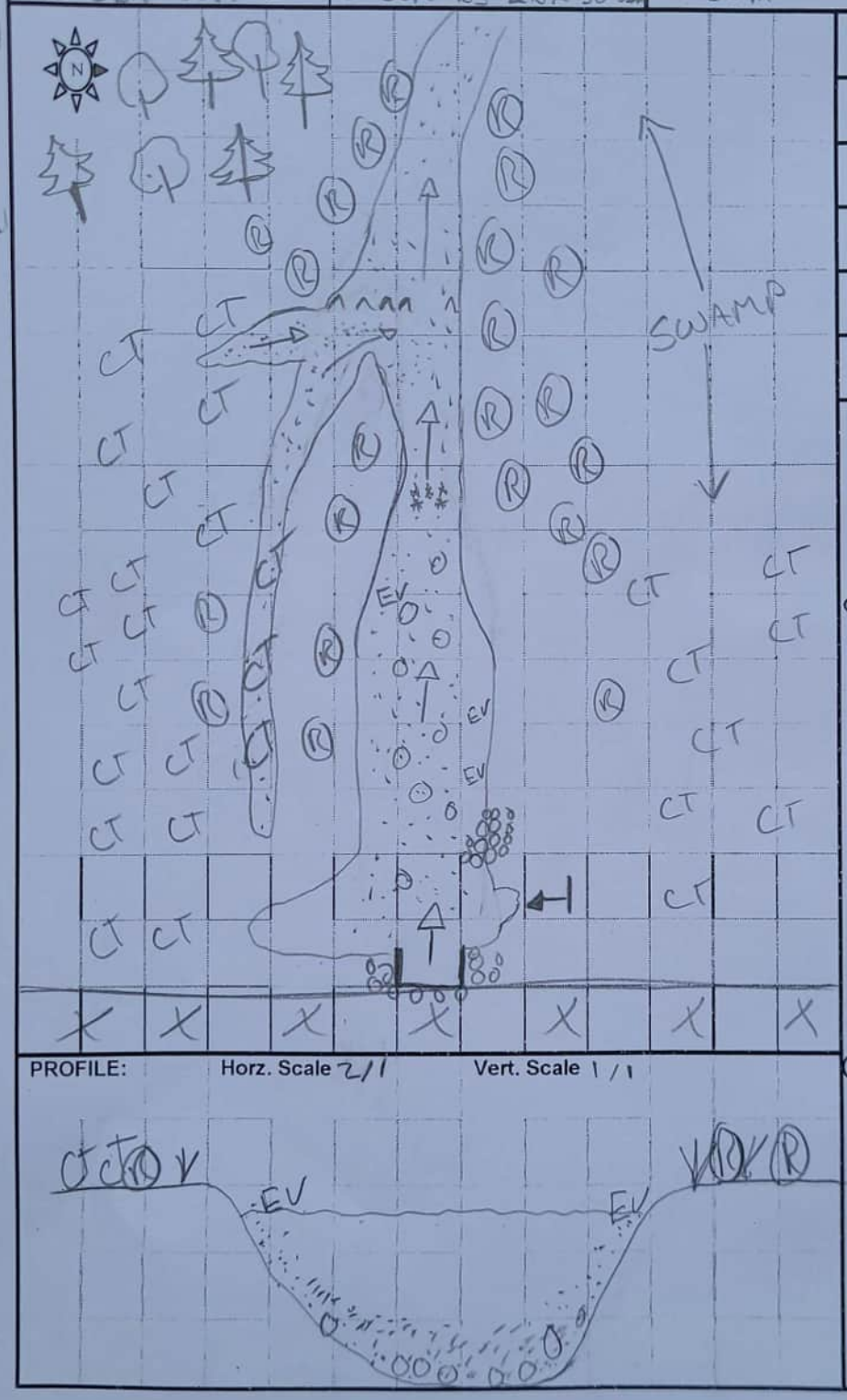
® Riparian Tree

⊢► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
⌴ Culvert

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS 2DA 20m + 2GA	0-20m DS 2DA 30-50	50m	1/3 V 1/2 H



PROFILE: Horz. Scale 2/1 Vert. Scale 1/1

PROJECT #: 60713279

MAPPER: P. Hebert

NAME OF WATERBODY: Unnamed

CROSSING #: 12 +275

STATION #:

DATE: DD-MMM-YY: 29/APR/24

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▮ Island/Bar

⁘ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

⊢► Seep/Spring
------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x-x- Fence line
└┘ Culvert

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS	Hwy 11 North of Sapawe	50m ZOA	3/1 V 2/1 H

PROJECT #: 60713279

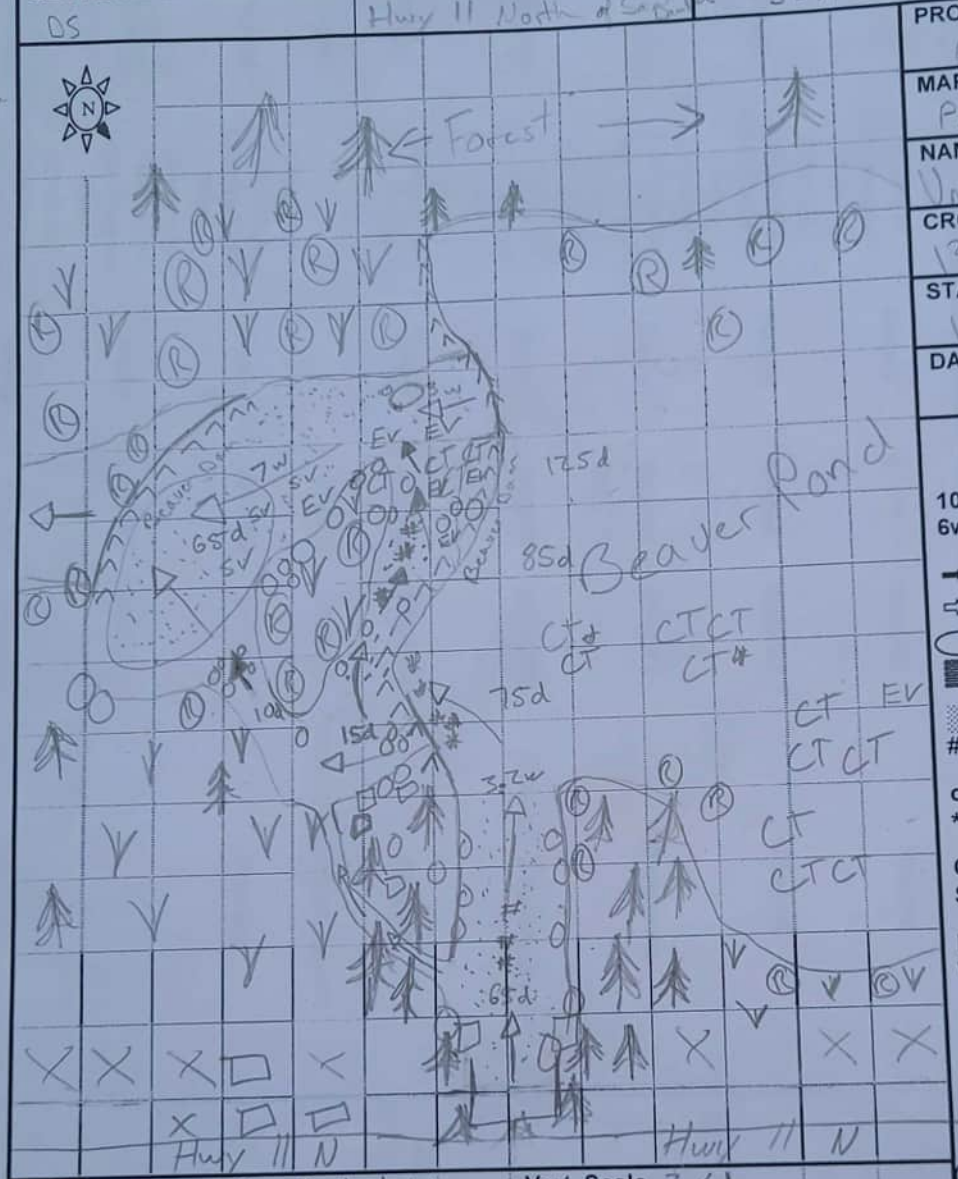
MAPPER: P. Hebert

NAME OF WATERBODY: Unnamed Trib to Sturgeon

CROSSING #: 13+400 Rt/Lt.

STATION #: 13+400 Rt/Lt.

DATE: DD-MMM-YY 30/04/2024



PROFILE: DS chan. Horz. Scale 1 / 1 Vert. Scale 2 / 1

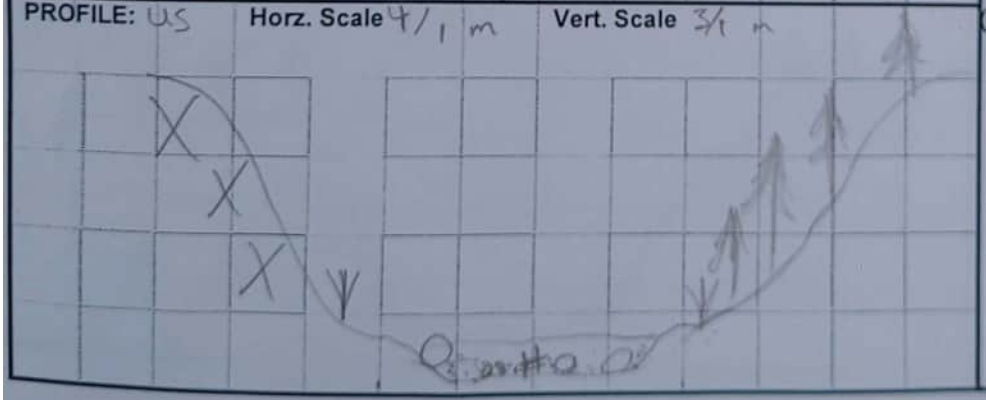
LEGEND

- **10d** depth (cm)
- **6w** width (m)
- ➡ Riffle
- ⇨ Run/Glide
- ◯ Pool
- ▒ Island/Bar
- ⁘ Fine Substrate
- ### Gravel Substrate
- **oOooO** Cobble /Boulder
- *** Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- /////// Eroded Bank
- **XXX** Riprap / Other Stabilization
- ⊂⊃ Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- ⊢► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- ⌴ Culvert

↑ tree
Y - herbaceous / gr
□ - large boulder / h

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 20 20A	Hwy 11 N	20 20A	1/ 1/2 V 1/1 H

PROFILE: US Horz. Scale 1/1 m Vert. Scale 1/1 m



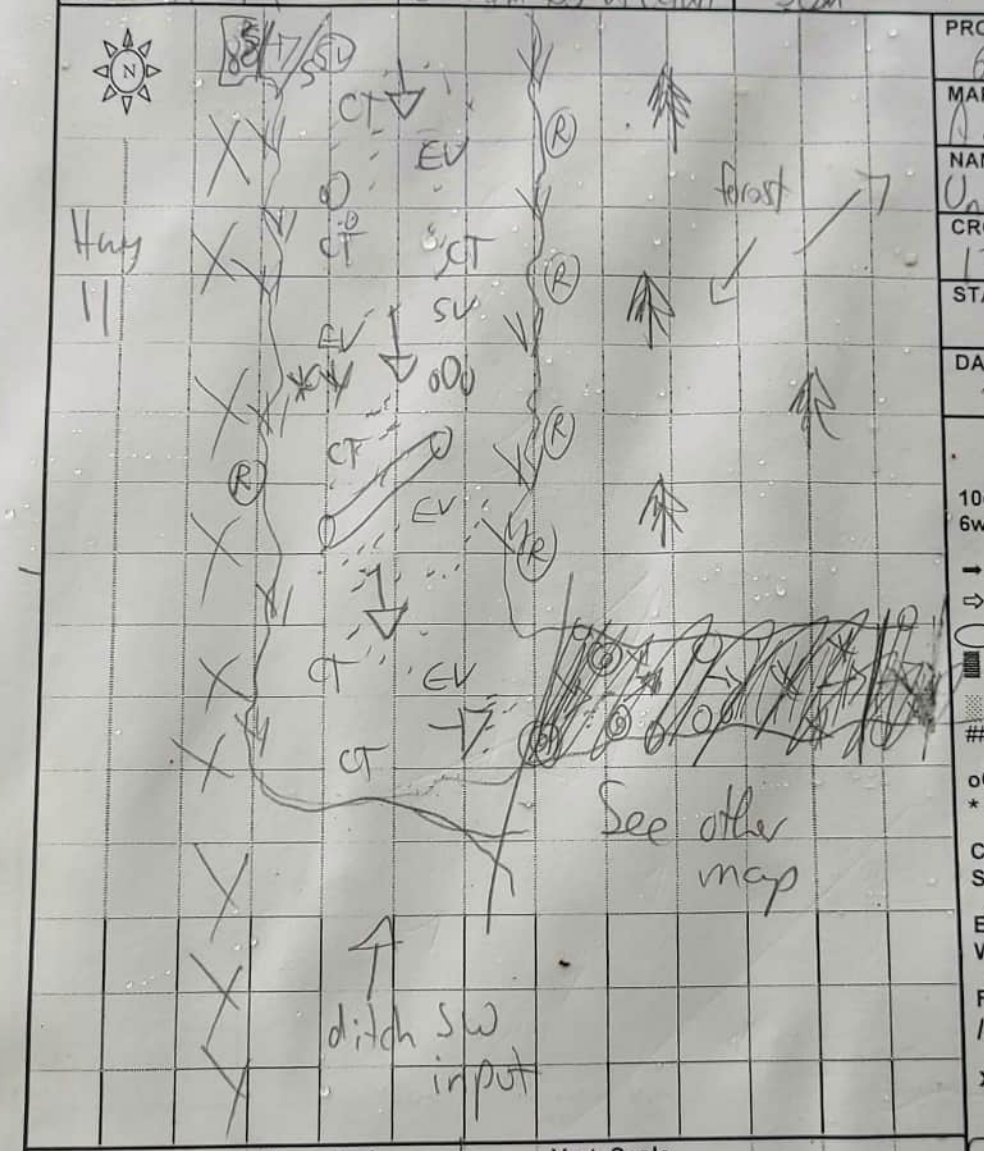
PROJECT #:	60713279
MAPPER:	P. Hébert
NAME OF WATERBODY:	Unnamed Trib. Stream
CROSSING #:	13+400 Blythe
STATION #:	13+400 Blythe
DATE: DD-MMM-YY	30/04/2024

LEGEND

- 10d depth (cm)
- 6w width
- → Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▮ Island/Bar
- ⁘ Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- ⬭ Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- ⊢► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- ⊔ Culvert

↟ tree
⩛ - herbaceous / grass
□ - large boulder / blast

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZOA R1	0-50m DS of culvert	30m	1/3V 1/1H



PROJECT #: 60713279

MAPPER: A. Inerisell

NAME OF WATERBODY: Unnamed trib Little Sturgeon

CROSSING #: 13+928 Blythe

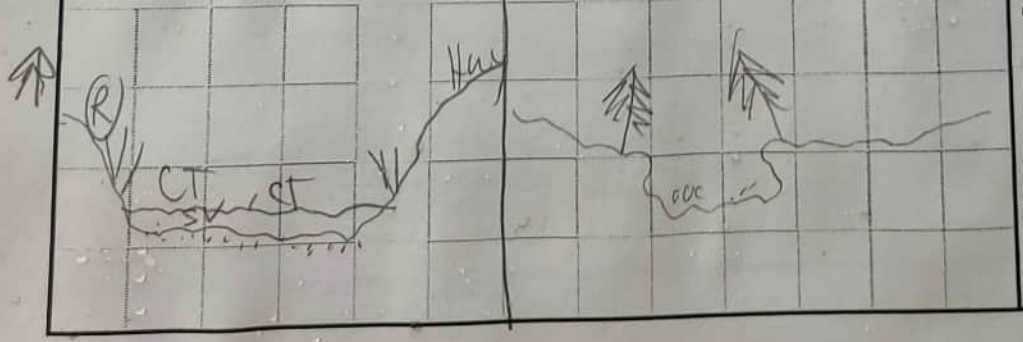
STATION #:

DATE: DD-MMM-YY: 30-04-2024

LEGEND

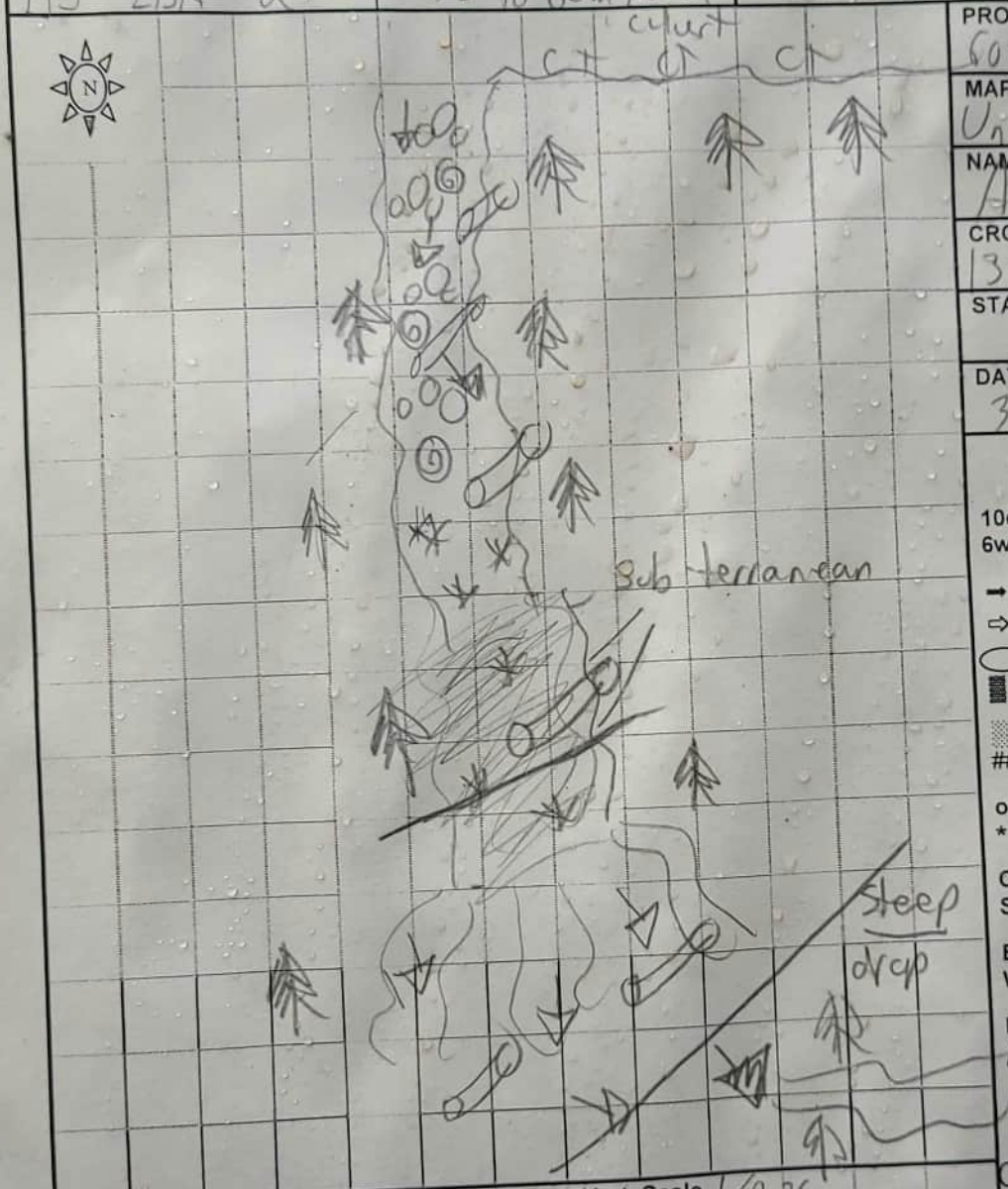
- 10d depth (cm)
- 6w width
- ➡ Riffle
- ⇨ Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- *** Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- Ⓡ Riparian Tree
- ⊢► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- Culvert

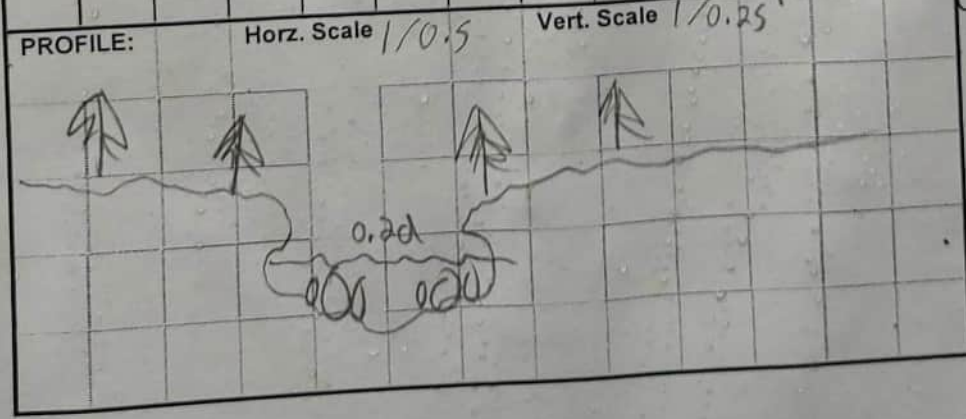
PROFILE: Horz. Scale Vert. Scale



↟ tree
Ψ - herbaceous / grass
□ - large boulder / blast

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZDA 2	30 to 60m DS of culvert	~30m	1/2V 1/1H





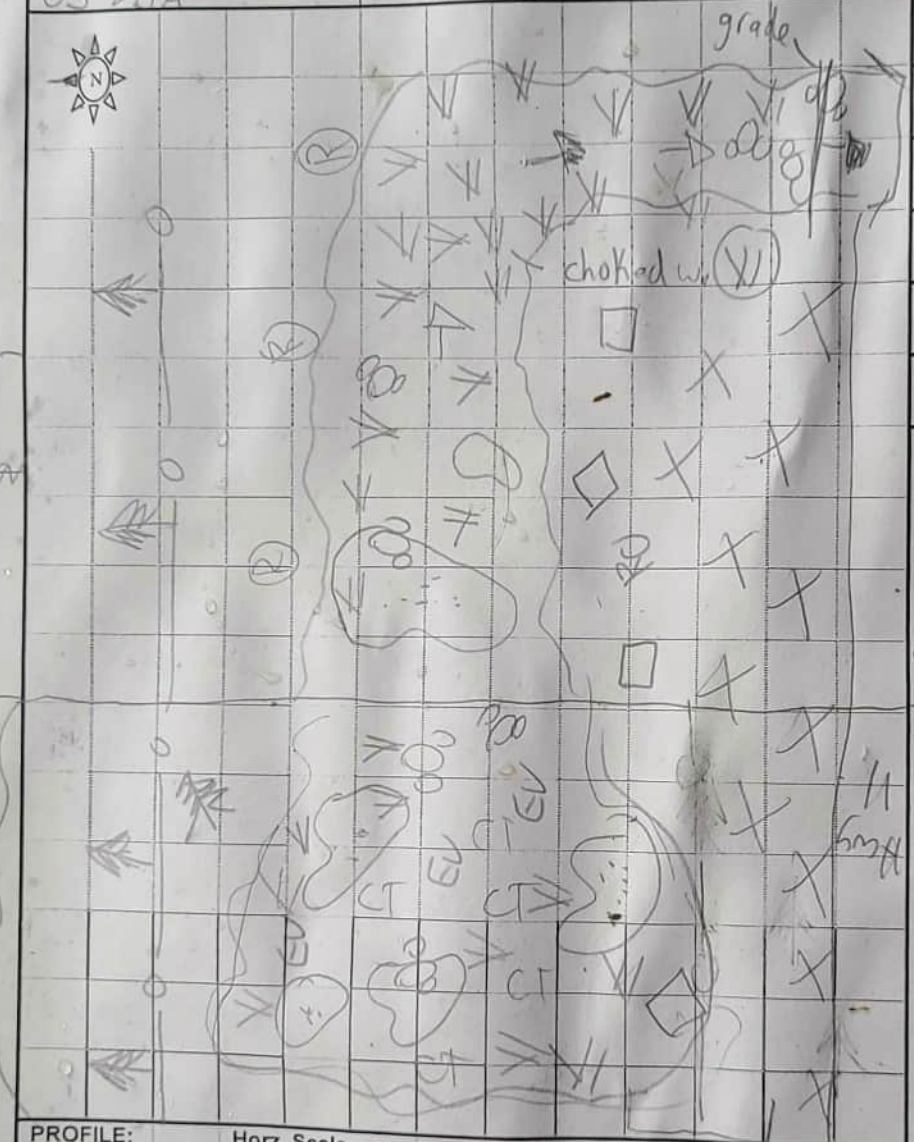
PROJECT #: 60713279
MAPPER: Unnamed to Little Sturgeon
NAME OF WATERBODY: A. Ingriselli
CROSSING #: 13+928 Blythe
STATION #:
DATE: DD-MMM-YY 30/04/24

LEGEND

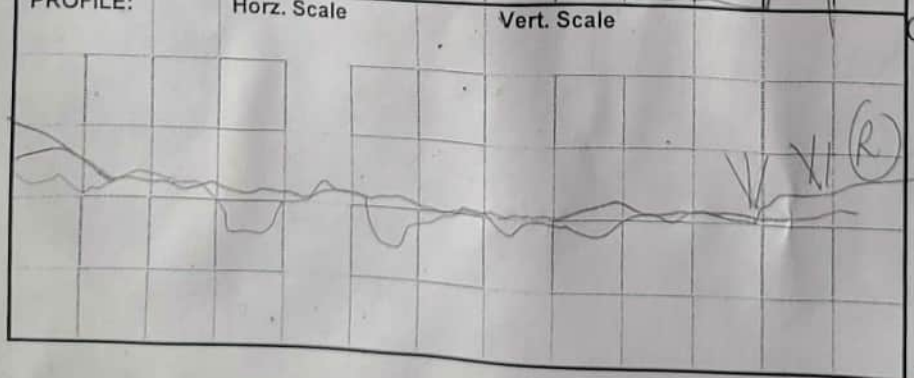
- 10d depth (cm), 6w width
- → Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▒ Island/Bar
- ⁘ Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- ⊂⊃ Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- ⊢► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- ⊔ Culvert

↑ tree
✳ - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 20A	0-20m US of culvert	~20m	V2V H0.5H



PROFILE: Horz. Scale Vert. Scale



PROJECT #: 60713279

MAPPER: A. Ingriselli

NAME OF WATERBODY: Unnamed trib to Little Sturgeon

CROSSING #: 13+928 Blythe

STATION #:

DATE: DD-MMM-YY: 30-04/24

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▒ Island/Bar

⁘ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction

Ⓡ Riparian Tree

Seep/Spring
------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
⌴ Culvert

↟ tree
Ѱ - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US ZOA	Hwy 11 N	20 m ZOA 40 CA	1/2 V 1/1 H

PROJECT #: 6073279

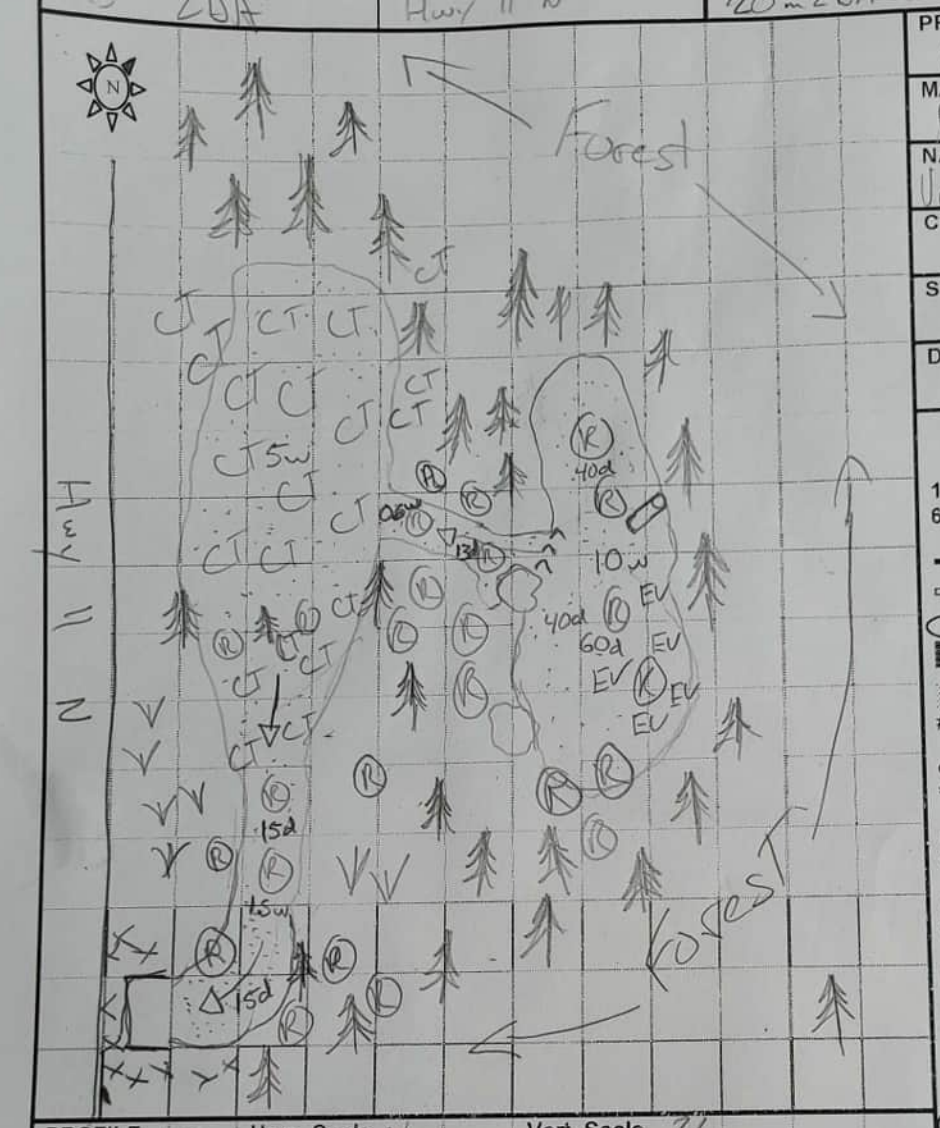
MAPPER: P. Hébert

NAME OF WATERBODY: Unnamed trib. Little Sturgeon

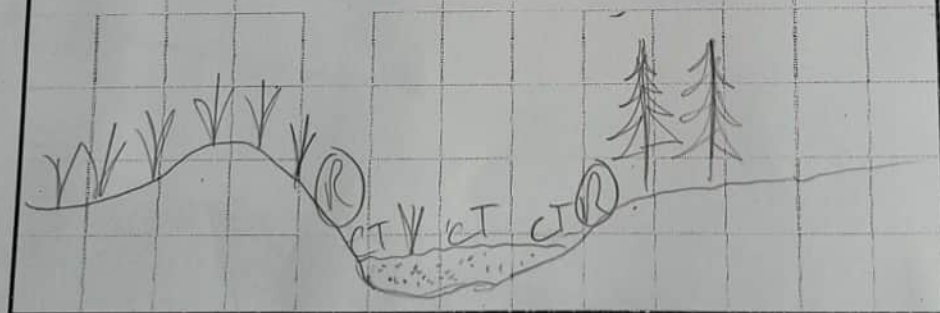
CROSSING #: 14+359 Blythe

STATION #:

DATE: DD-MMM-YY 30/04/24



PROFILE: US Horz. Scale 1/1 Vert. Scale 2/1



LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▒ Island/Bar
- ⁘ Fine Substrate
- **###** Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- **//////** Eroded Bank
- **XXX** Riprap / Other Stabilization
- ⬭ Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- **®** Riparian Tree
- ⊢► Seep/Spring
- ------ Undercut Bank
- — Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- ⌴ Culvert

V - grasses

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZDA	Hwy 11 N	50 ZDA	1/3 ✓ 1/1 H

PROJECT #: 6073279

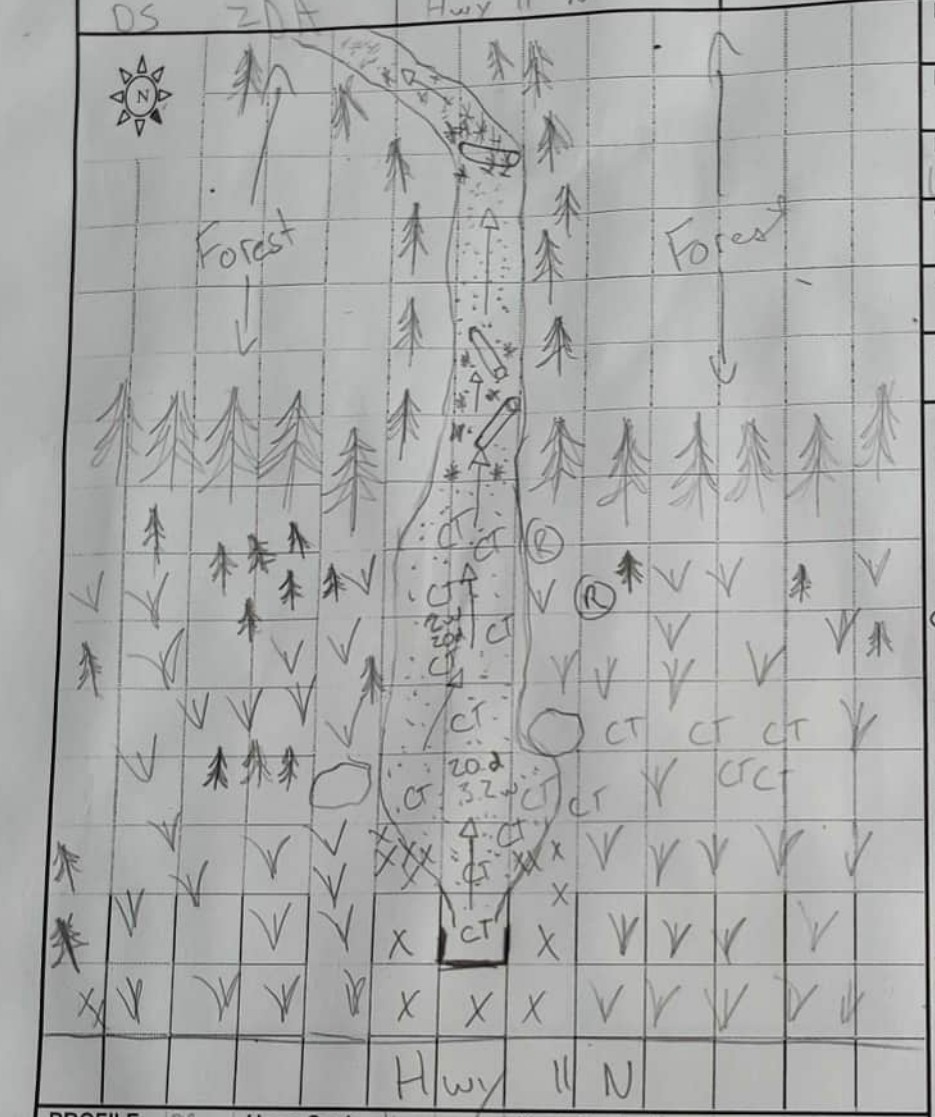
MAPPER: R. Hobert

NAME OF WATERBODY: Unnamed trib. Little Sturgeon

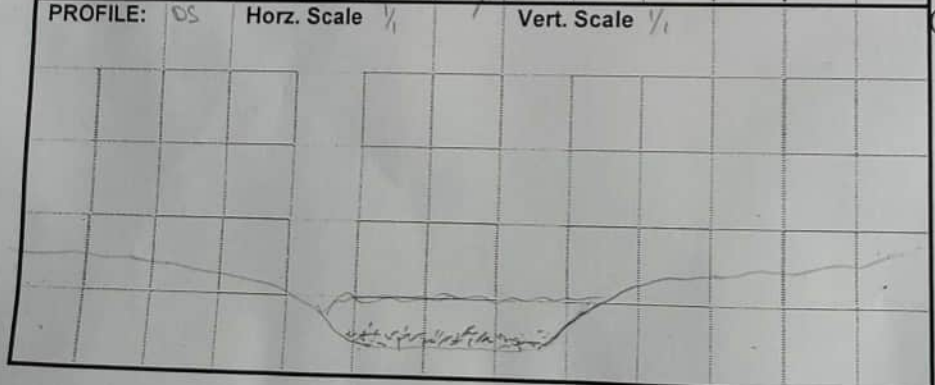
CROSSING #: 14+359 Blythe

STATION #:

DATE: DD-MMM-YY 30/04/24



PROFILE: DS Horz. Scale 1/1 Vert. Scale 1/1



LEGEND

10d depth (cm)
6w width (m)

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

▒ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

⊢► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

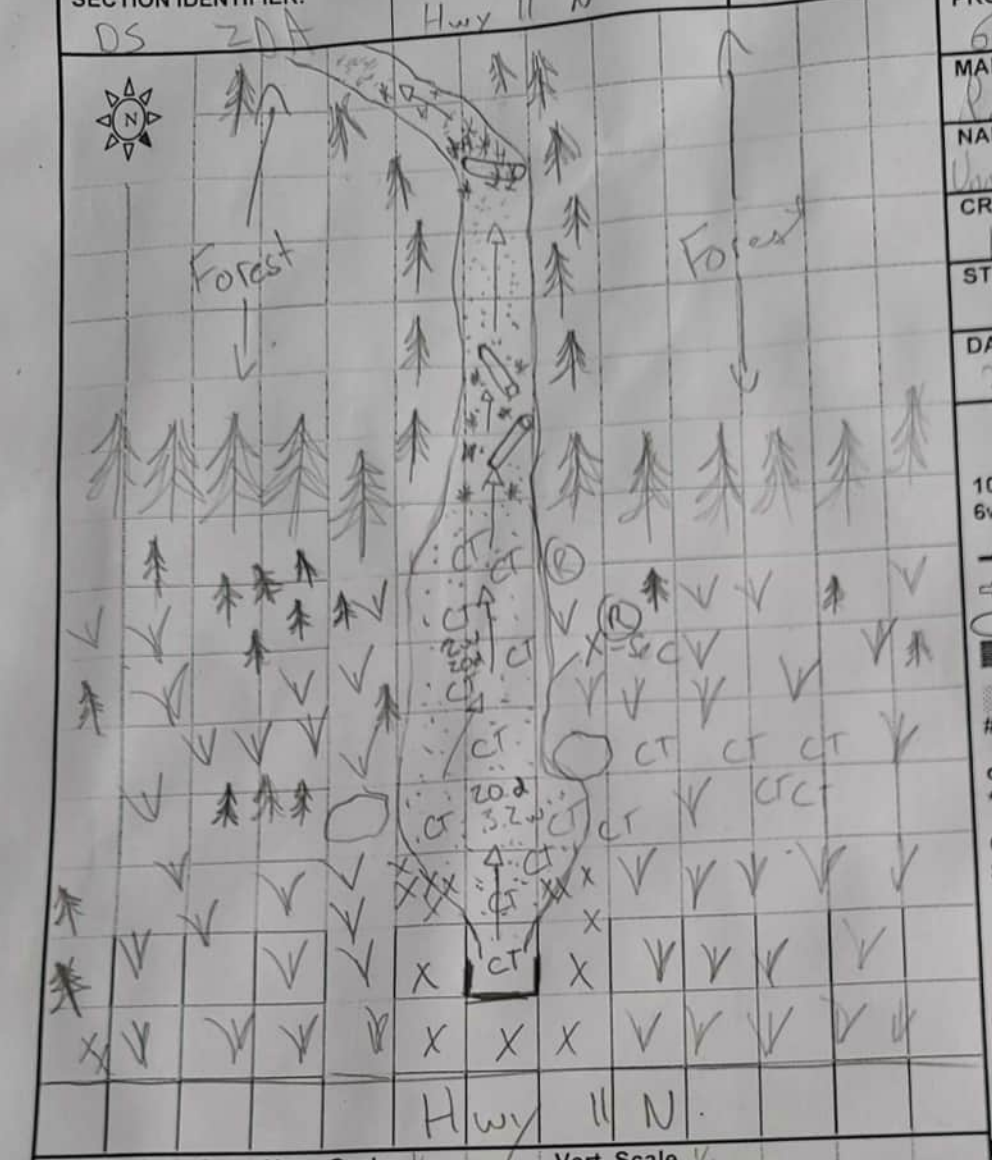
-x--x- Fence line
⌴ Culvert

↟ tree
ѱ - herbaceous / grass
□ - large boulder / blast rock

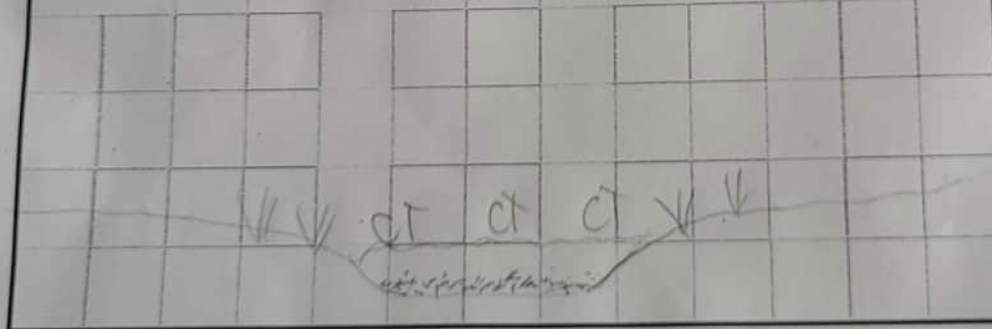
Ministry of Transportation
Environmental Guide for Fish and Fish Habitat

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZDA	Hwy 11 N	50 ZDA	1/3 ✓ 1/1 H

PROJECT #: 60713279
MAPPER: P. Holbert
NAME OF WATERBODY: Unnamed trib. to Little Sturgeon
CROSSING #: 14+359 Blythe
STATION #:
DATE: DD-MMM-YY 30/04/24



PROFILE: DS **Horz. Scale** 1/1 **Vert. Scale** 1/1

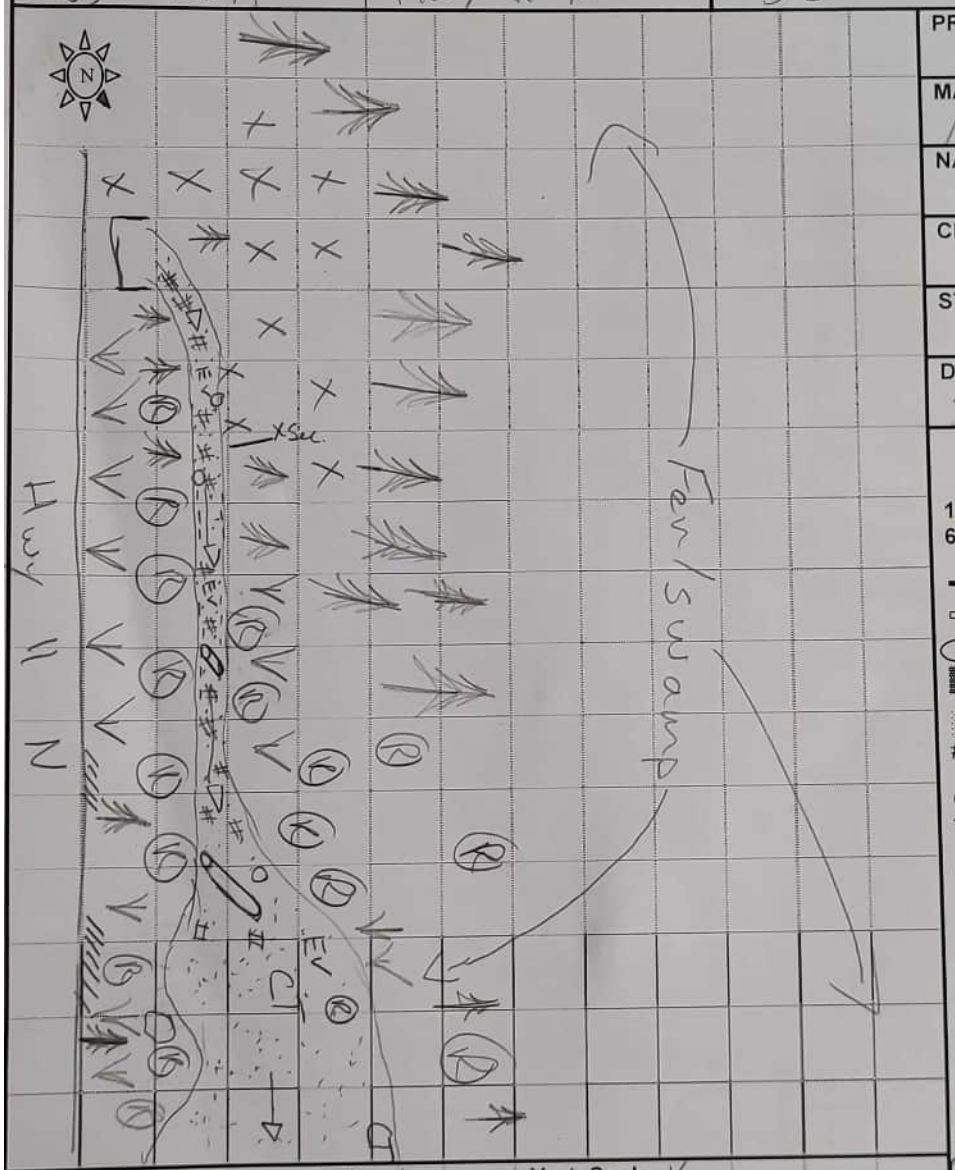


LEGEND

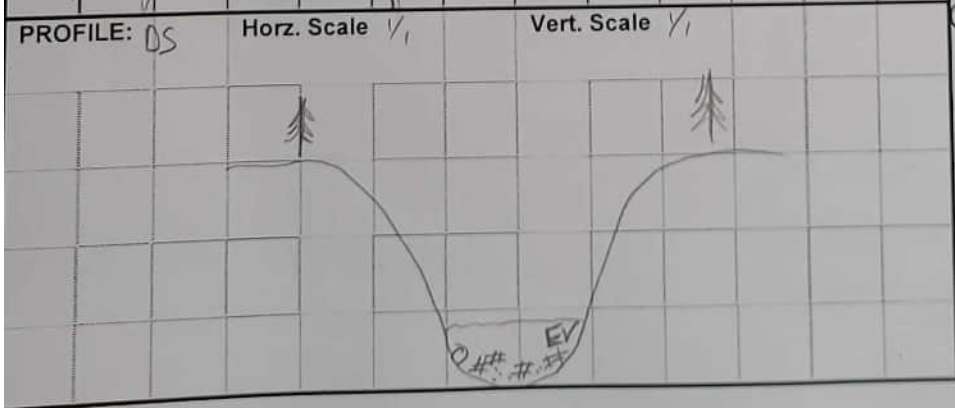
- 10d depth (cm)
- 6w width (~)
- → Riffle
- ⇨ Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- Culvert

tree
- herbaceous / gr
- large boulder / h

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZDA	Hwy 11 N	50	1/1 V 1/2 H



PROFILE: DS Horz. Scale 1/1 Vert. Scale 1/1



PROJECT #: 60713279

MAPPER: A. Ingrisolli

NAME OF WATERBODY:

CROSSING #: 15+512 Blythe

STATION #:

DATE: DD-MMM-YY 30/04/24

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▮ Island/Bar

⁘ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction

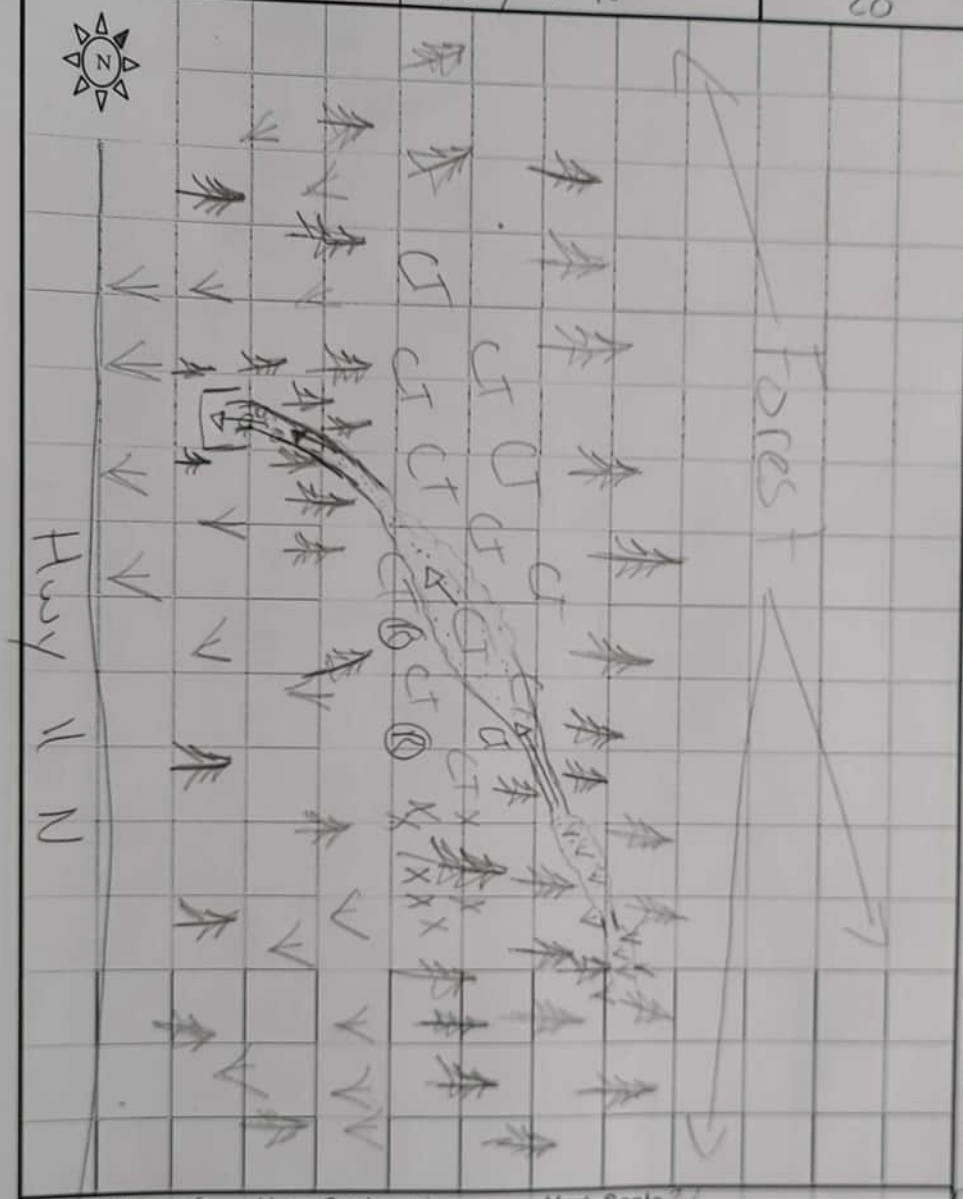
® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US	Hwy 11 N	20	1/1 V 1/2 H



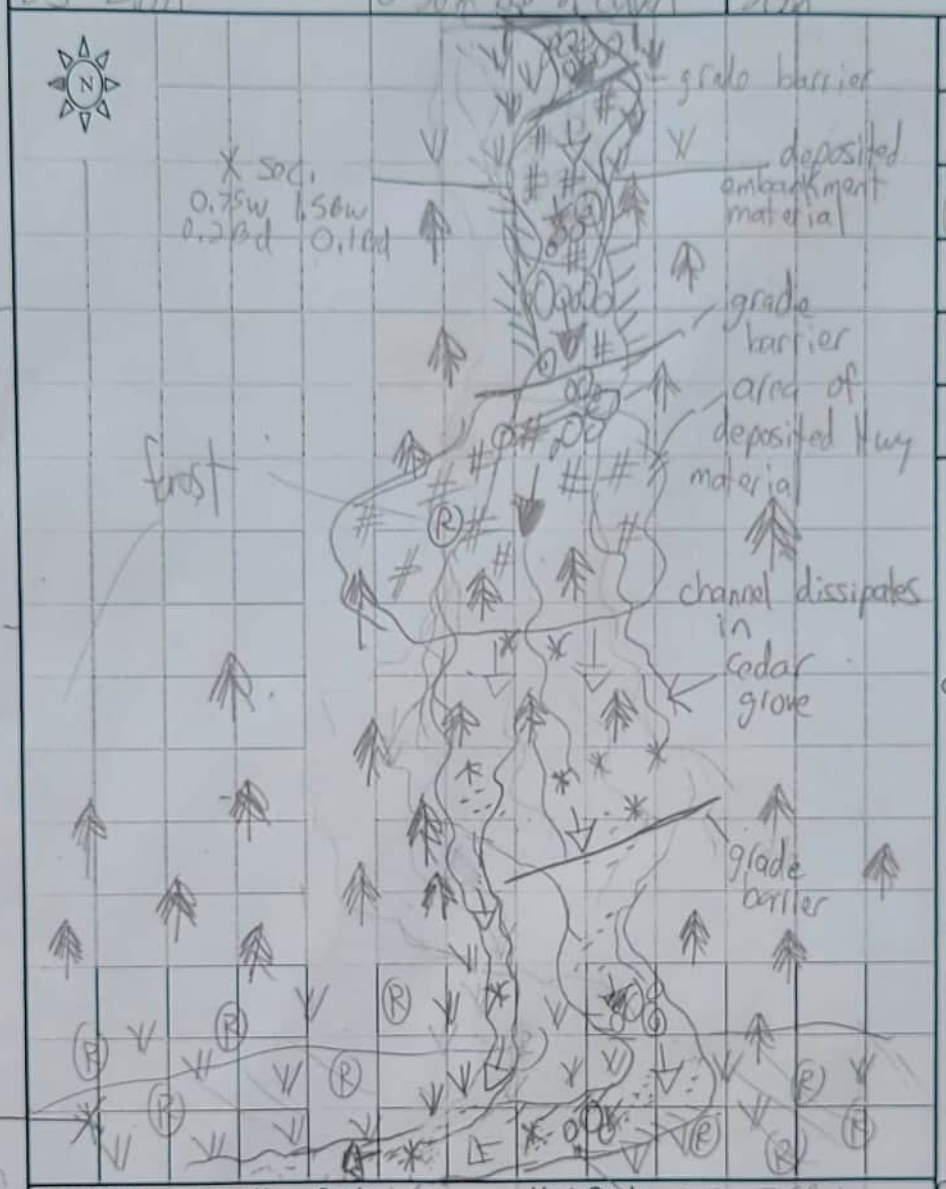
PROFILE: US Horz. Scale 1/1 Vert. Scale 1/1

PROJECT #:	60713279
MAPPER:	P. Hebert
NAME OF WATERBODY:	
CROSSING #:	15+512 Bypass
STATION #:	
DATE: DD-MMM-YY	30-Apr-24

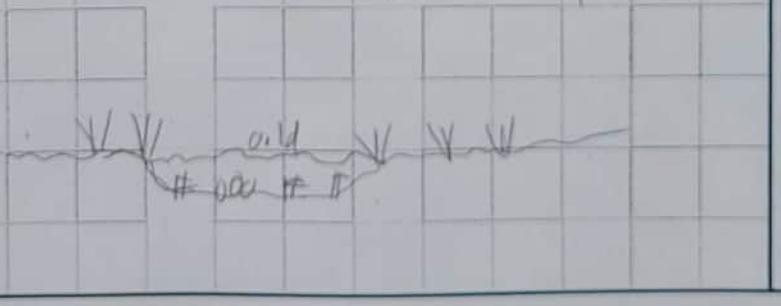
LEGEND

- 10d depth (cm)
- 6w width
- ➖ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▮ Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- Ⓡ Riparian Tree
- Seep/Spring
- Undercut Bank
- Barrier to Fish Movement
- S Seasonal Barrier
- Fence line
- Culvert

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZOA	0-50m DS of culvert	50m	V:3V V:0.5H



PROFILE: Horz. Scale 1/0.5 Vert. Scale 1/0.5



PROJECT #: 60713279
MAPPER: A. Ingersoll
NAME OF WATERBODY: Unnamed trib. L. Shrigley
CROSSING #: 10+072 Notman
STATION #:
DATE: DD-MMM-YY 01/05/24

LEGEND

- **10d** depth (cm)
- **6w** width
- Riffle
- Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- **###** Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- **////////** Eroded Bank
- **XXX** Riprap / Other Stabilization
- Instream Log/Tree
- **^^^** Dam/Weir/Obstruction
- **®** Riparian Tree
- Seep/Spring
- **--------** Undercut Bank
- **—** Barrier to Fish Movement
- **-S-** Seasonal Barrier
- **-x--x-** Fence line
- Culvert

↑ tree
¥ - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS 2GA	50-200m DS of culvert	50m	V1:10V 1/0.5H

PROJECT #: 60713279

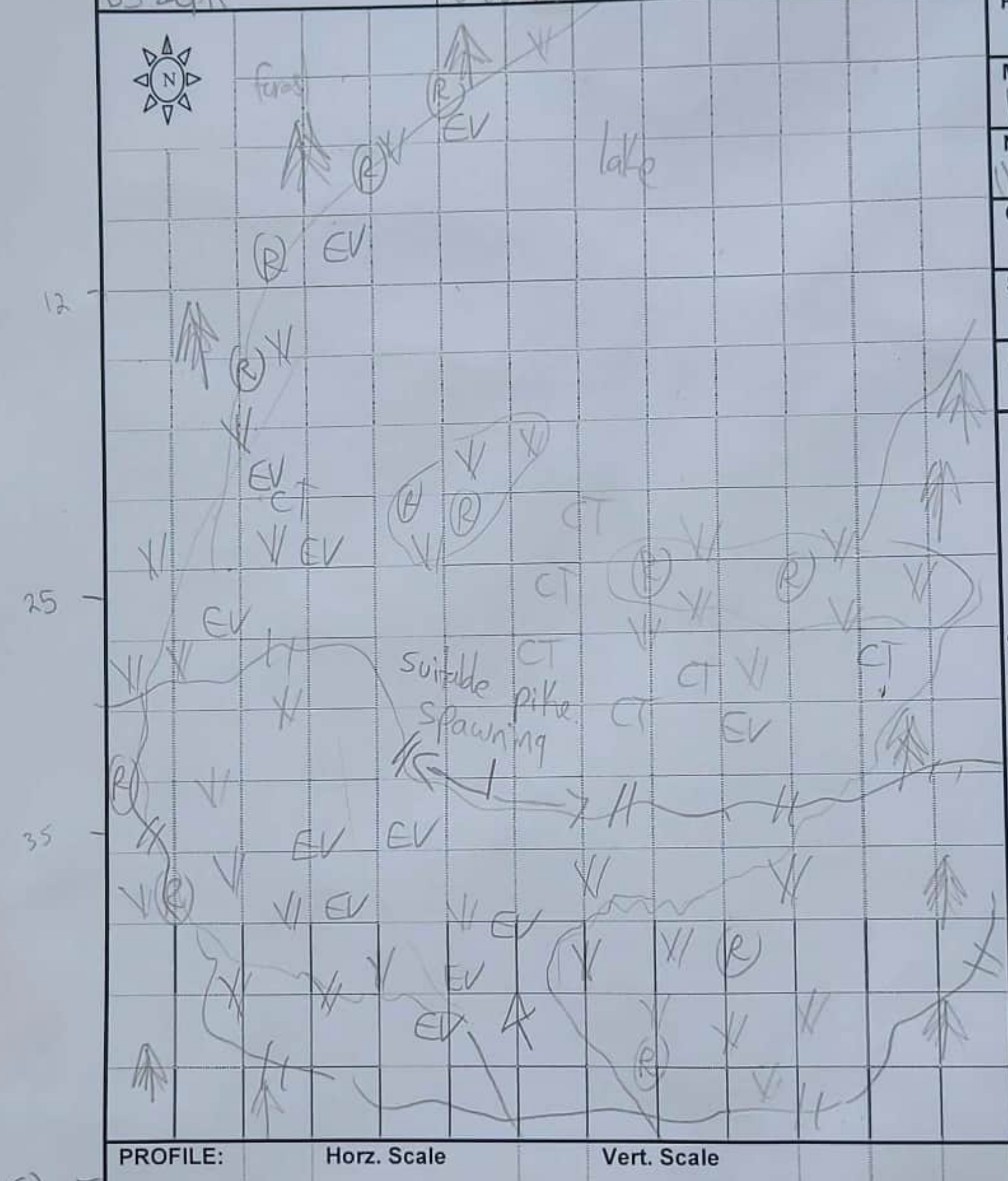
MAPPER: A. Ingrisoll

NAME OF WATERBODY: Unnamed Trib. Little Tamika

CROSSING #: 10+072 Not man

STATION #:

DATE: DD-MMM-YY 01/05/2024



PROFILE: Horz. Scale Vert. Scale

LEGEND

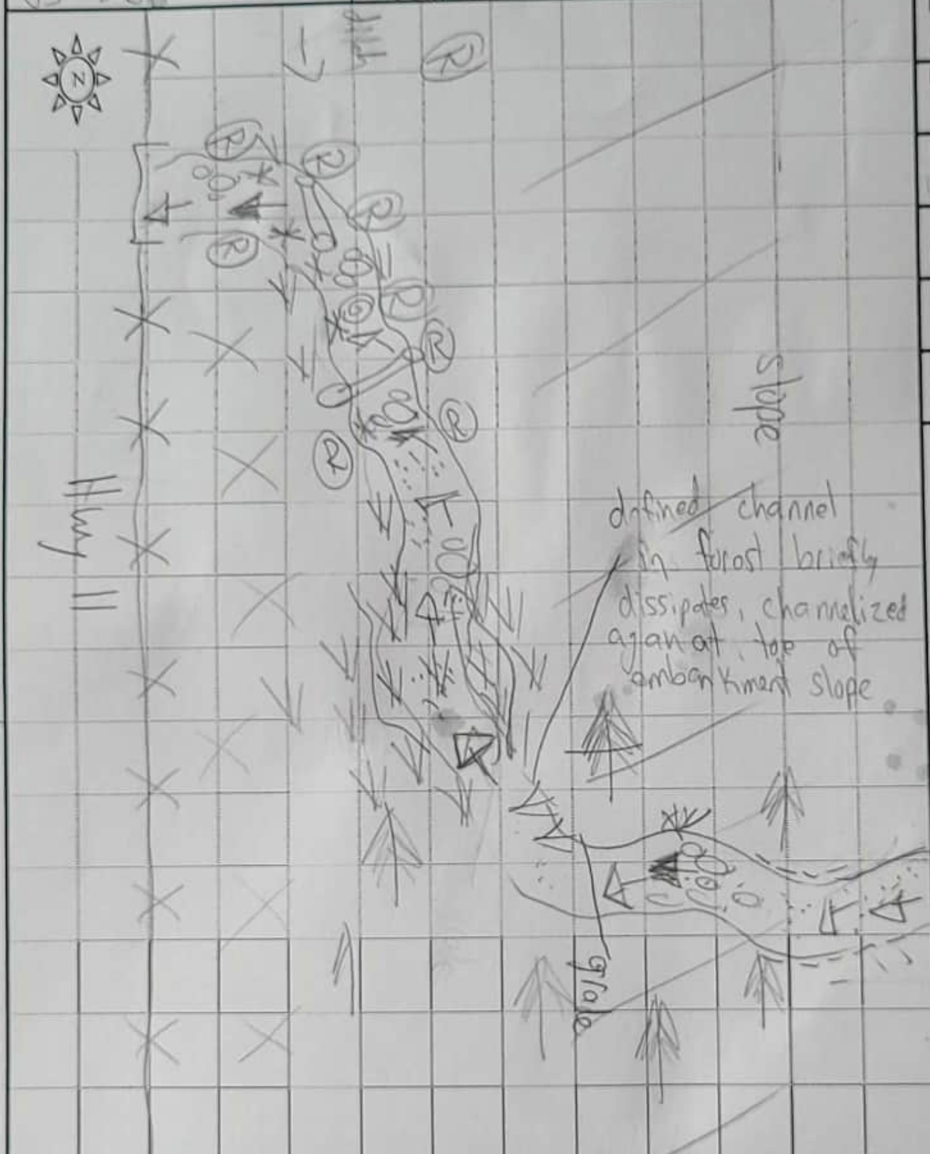
- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▓ Island/Bar
- ░ Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- ////// Eroded Bank
- **XXX** Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- |► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- └┘ Culvert

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US ZDA	0-20m US of culvert	20m ZDA	1/2V 1/0.5V

0-20m ZDA

20

20-50m ZGA



PROJECT #: 60713279

MAPPER: 60713279

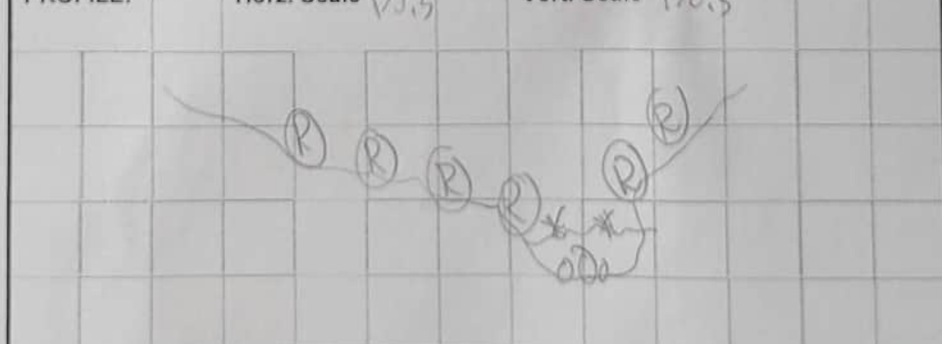
NAME OF WATERBODY: Unnamed Trib. Little Tamiko

CROSSING #: 10+072 Natman

STATION #: 10+072

DATE: DD-MMM-YY 01/05/2024

PROFILE: Horz. Scale 1/0.5 Vert. Scale 1/0.5



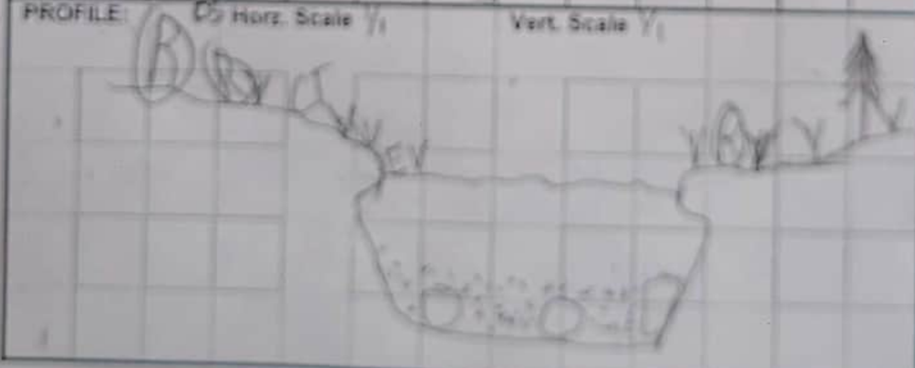
LEGEND

- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▓ Island/Bar
- ░ Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- */////// Eroded Bank*
- **XXX** Riprap / Other Stabilization
- ⊂⊃ Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- ├► Seep/Spring
- -------- Undercut Bank
- ▬ Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- └┘ Culvert

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS 50m ZOA	Hwy 11 N	50m	1/3 V 1/2 H

Suitable spawning Northern Pike in alder swamp on RB

PROFILE: DS Horz. Scale 1/1 Vert. Scale 1/1



PROJECT #: 60713279

MAPPER: P. Hobert

NAME OF WATERBODY: Unnamed Trib. Little Trout

CROSSING #: 10 1891 Nutmon

STATION #:

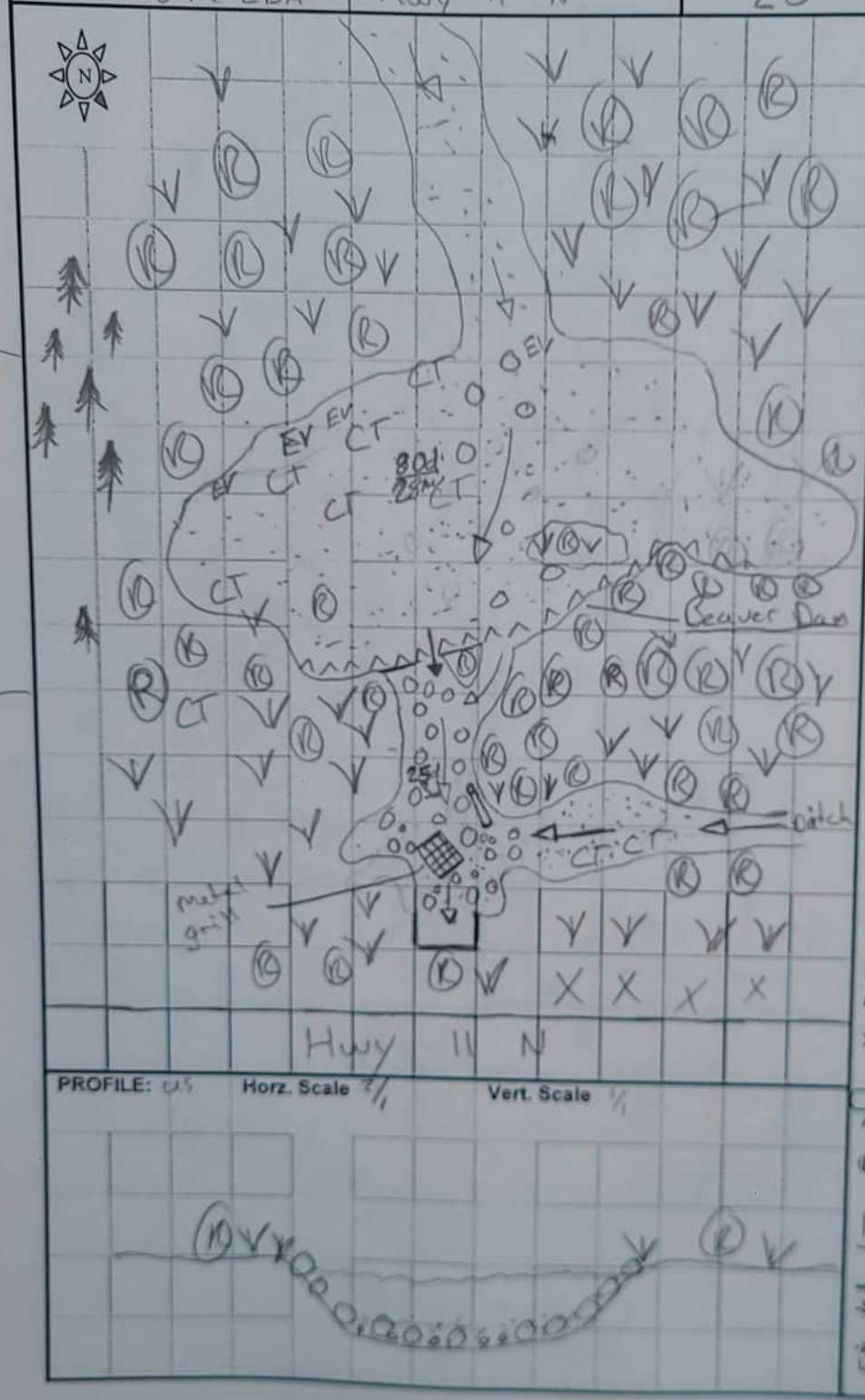
DATE: DD-MMM-YY 01/05/2024

LEGEND

10d depth (cm)
5w width (m)
→ Riffle
⇨ Run/Glide
Pool
Island/Bar
Fine Substrate
\#\#\# Gravel Substrate
oOooO Cobble/Boulder
* * * Debris
CT Cattail
SV/FV Submerg/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
////// Eroded Bank
XXX Riprap / Other Stabilization
Instream Log/Tree
Dam/Weir/Obstruction
® Riparian Tree
Seep/Spring
Undercut Bank
Barrier to Fish Movement
-S- Seasonal Barrier
Fence line
Culvert

↑ Tree
Y - herbaceous / grass
□ - large boulder / bedrock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 20 m ZDA	Hwy 11 N	20	1/2



PROFILE: US Horz. Scale 1/1 Vert. Scale 1/1

PROJECT #: 60713279
MAPPER: P. Hébert
NAME OF WATERBODY: Unnamed Trib to Tomiko Lake
CROSSING #: 10+881 Notman
STATION #:
DATE: DD-MMM-YY 01-MAY-24

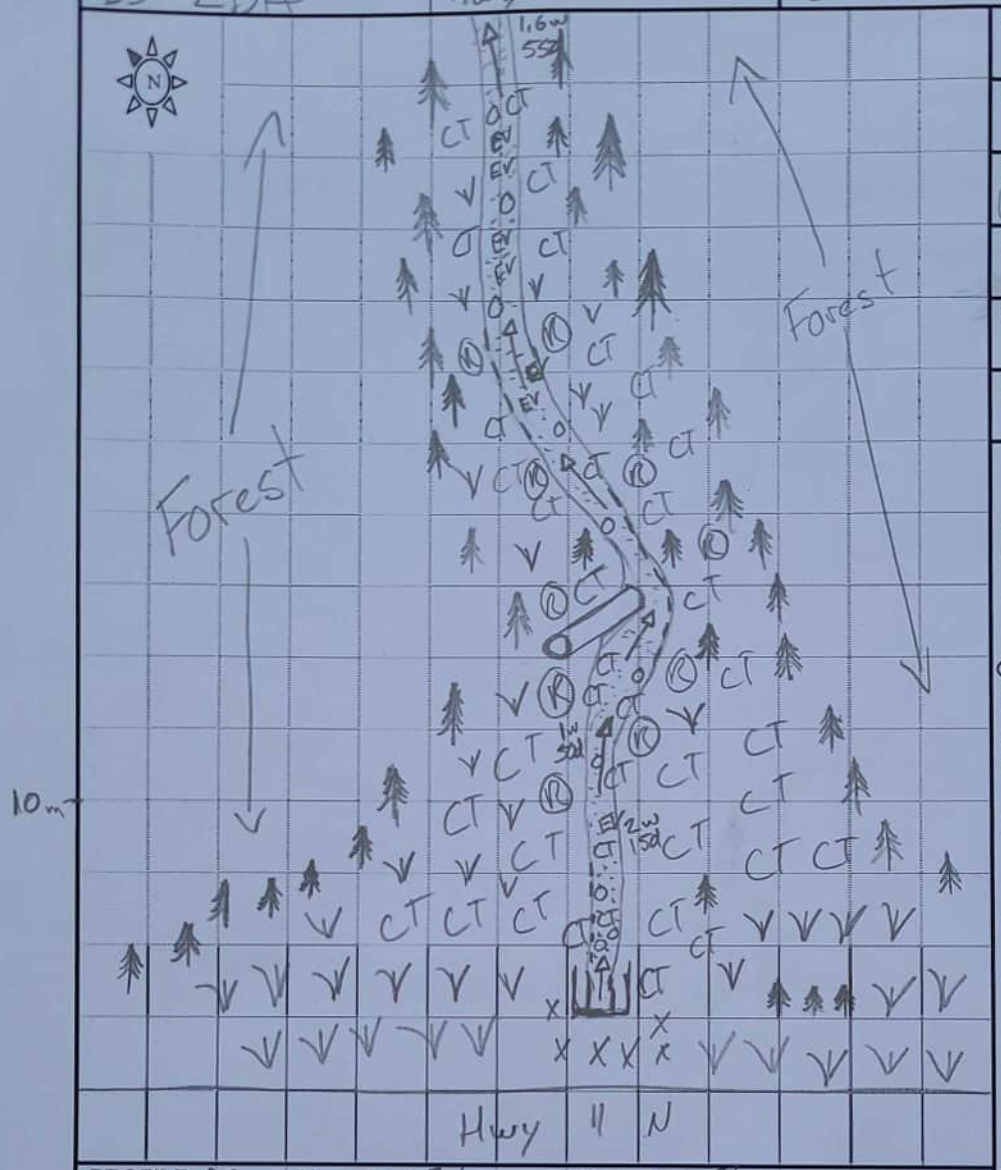
LEGEND

- 10d depth (cm)
- 6w width
- Riffle
- Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- *** Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- Ⓡ Riparian Tree
- Seep/Spring
- Undercut Bank
- Barrier to Fish Movement
- -S- Seasonal Barrier
- Fence line
- Culvert

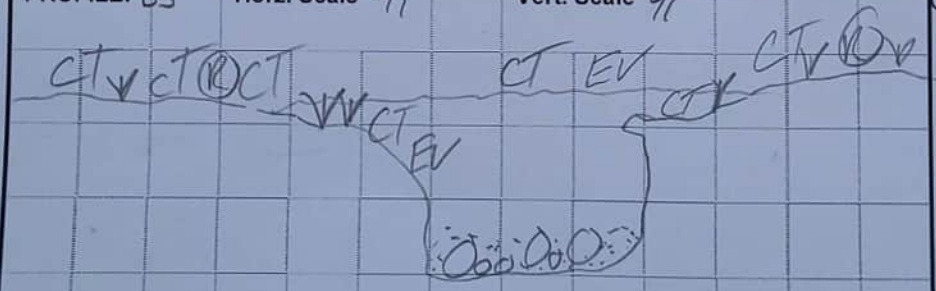
↑ tree
X = herbaceous / grass
□ = large boulder / bedrock rock

163.01

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZDA	Hwy 11 N	50	1/3 ✓ 1/2 H



PROFILE: DS Horz. Scale 2/1 Vert. Scale 2/1



PROJECT #:	60713279
MAPPER:	P. Hébert
NAME OF WATERBODY:	Unnamed trib. Little Tomiko
CROSSING #:	11+800 Notman
STATION #:	
DATE: DD-MMM-YY	2/5/24

LEGEND

10d depth (cm)
6w width (m)

➡ Riffle
⇨ Run/Glide
⬭ Pool
▒ Island/Bar

⁘ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
//////// Eroded Bank

XXX Riprap / Other Stabilization

⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

⊢► Seep/Spring
-------- Undercut Bank

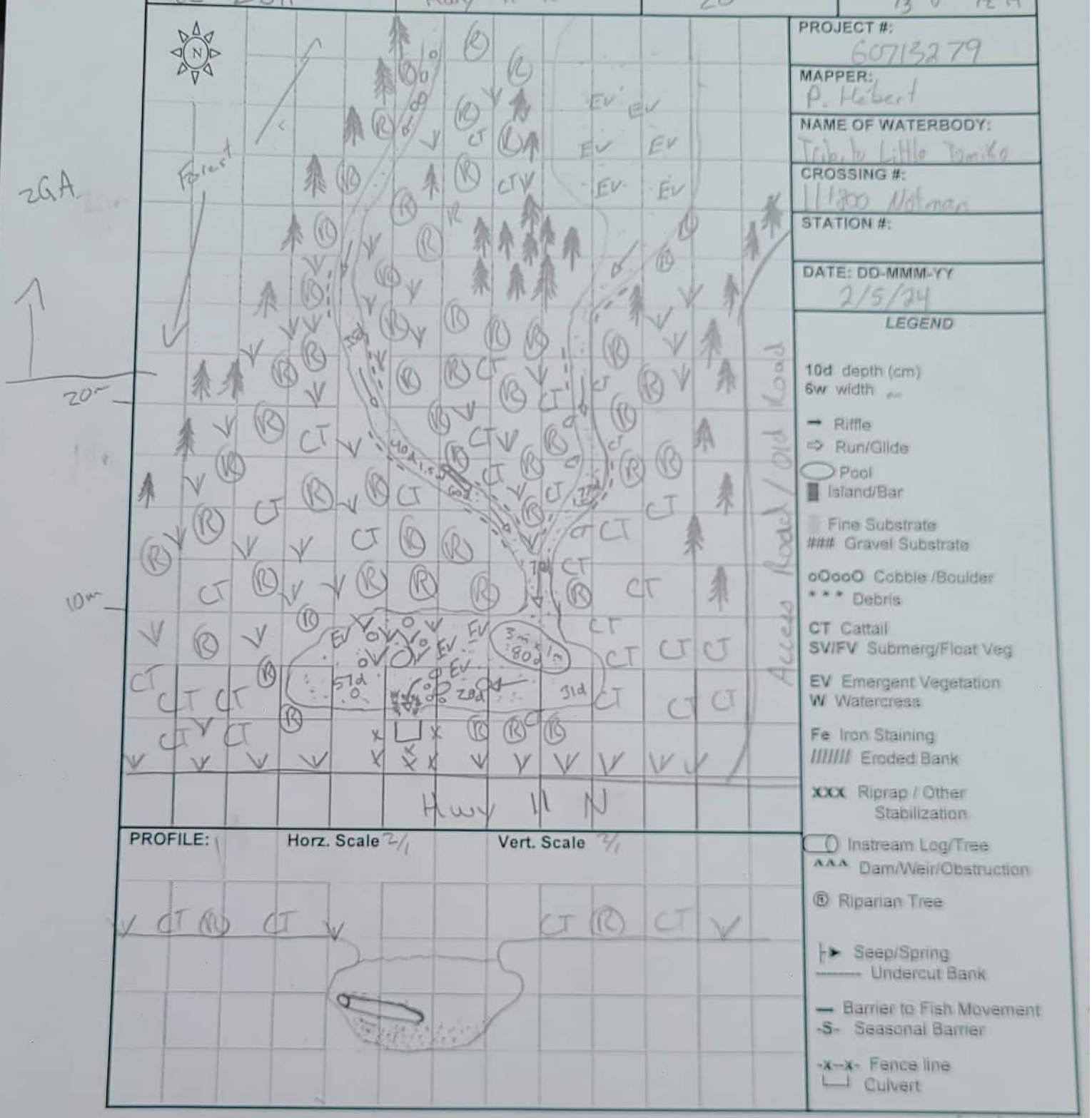
— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
⌴ Culvert

V → grasses

🌲 → trees

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 2DA	Hwy 11 N	20	1/3 V 1/2 H



PROJECT #: 60713279
MAPPER: P. Hébert
NAME OF WATERBODY: Tributary Little Jamieson
CROSSING #: 11800 Notman
STATION #:
DATE: DD-MMM-YY 2/5/24

LEGEND

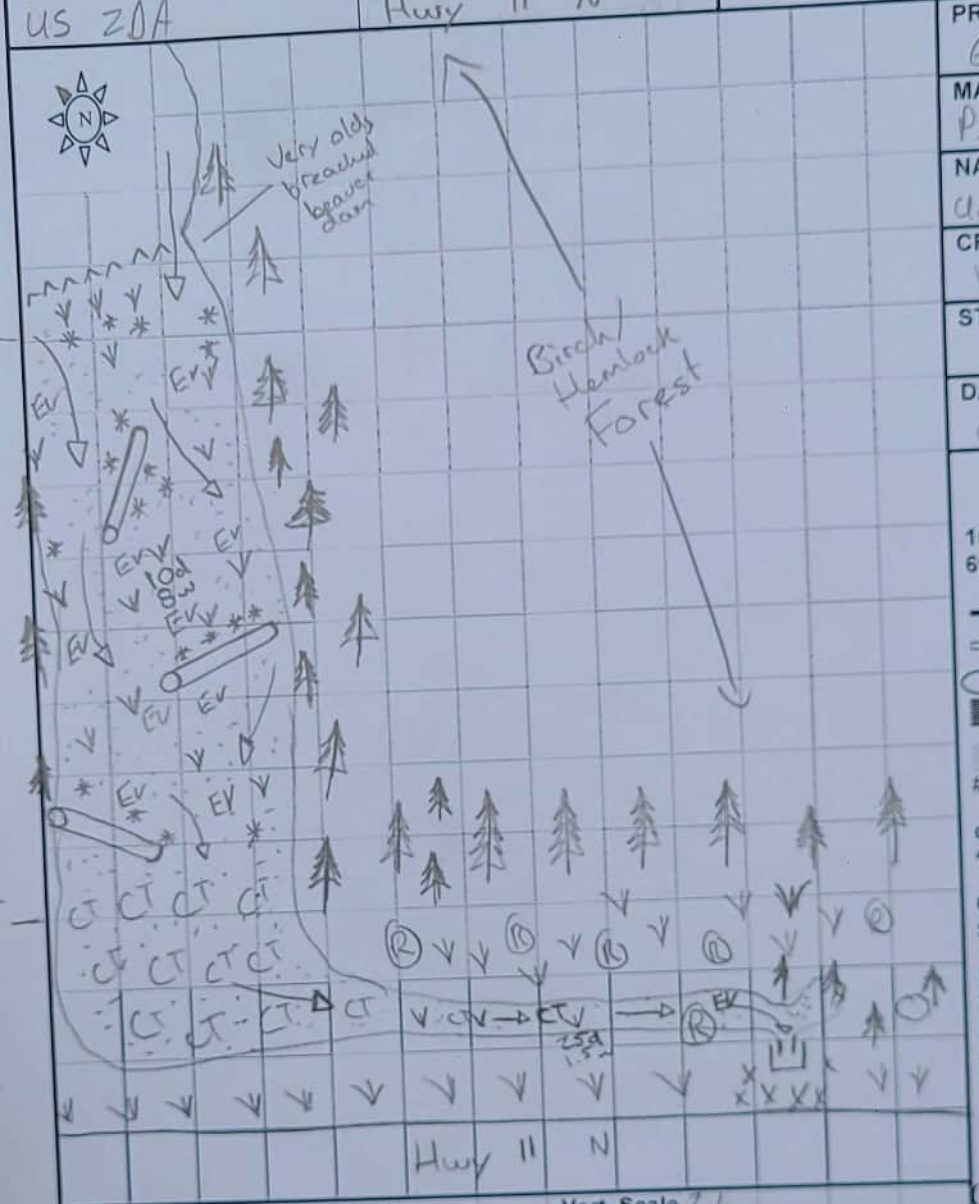
10d depth (cm)
6w width
→ Riffle
⇨ Run/Glide
Pool
Island/Bar
Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
* * * Debris
CT Cattail
SV/FV Submerg/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
/////// Eroded Bank
XXX Riprap / Other Stabilization
Instream Log/Tree
^^^ Dam/Weir/Obstruction
Ⓡ Riparian Tree
Seep/Spring
------ Undercut Bank
— Barrier to Fish Movement
-S- Seasonal Barrier
-X--X- Fence line
Culvert

V - grasses / herbaceous
T - trees

Ministry of Transportation
Environmental Guide for Fish and Fish Habitat

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 20A	Hwy 11 N	20	1/2 V 1/2 H

PROJECT #:	60713279
MAPPER:	P. Hébert
NAME OF WATERBODY:	Unnamed trib. Tomiko R
CROSSING #:	12+541 Northern
STATION #:	
DATE: DD-MMM-YY	02-MAY-24



LEGEND

- 10d depth (cm)
- 6w width (m)
- Riffle
- Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- Ⓡ Riparian Tree
- Seep/Spring
- Undercut Bank
- Barrier to Fish Movement
- -S- Seasonal Barrier
- Fence line
- Culvert

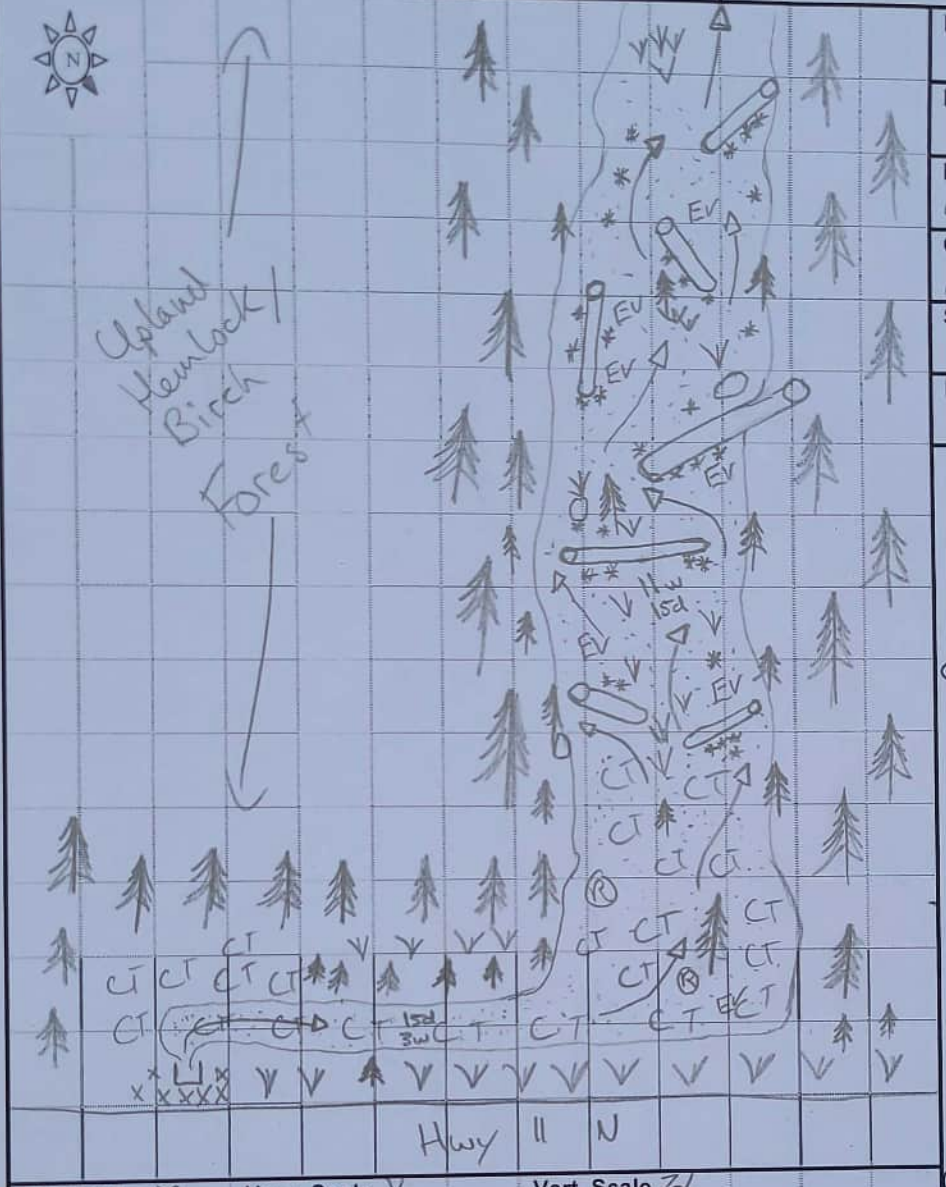
PROFILE: Horz. Scale Vert. Scale 2/1

↑ tree
Y - herbaceous / grass
□ - large boulder / bedrock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS ZOA	Hwy 11 N	50	1/3 V 1/3 H

50 m

20 m



PROFILE: DS Horz. Scale 1/2 Vert. Scale 2/1

PROJECT #:	60713279
MAPPER:	P. Hébert
NAME OF WATERBODY:	Unnamed trib of Tomiko R.
CROSSING #:	12+541 Notman
STATION #:	
DATE: DD-MMM-YY	02-MAY-24

LEGEND

10d depth (cm)
6w width (m)

➡ Riffle
⇨ Run/Glide
⬭ Pool
▩ Island/Bar

▒ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

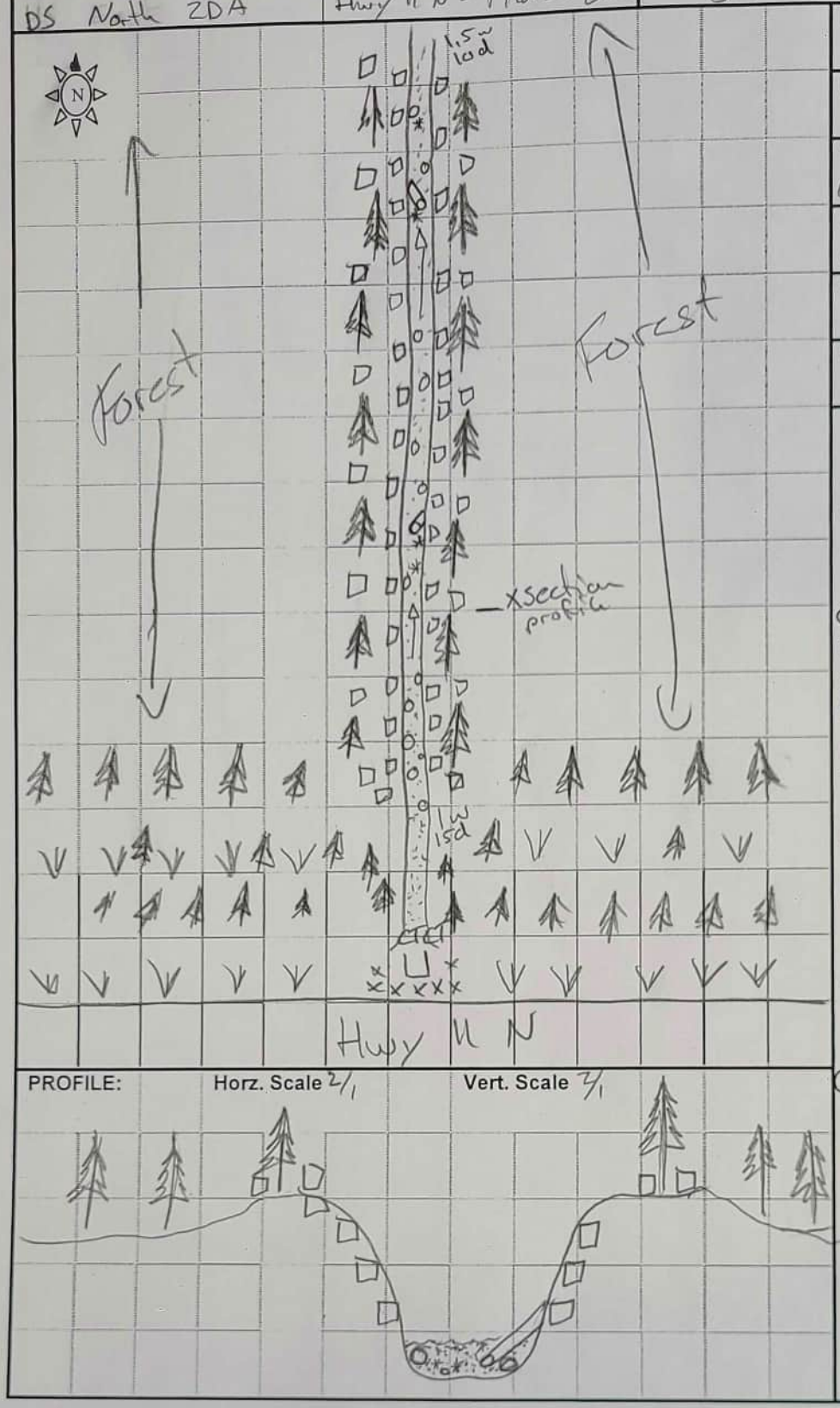
— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

Y - grasses / herbaceous

🌲 - trees

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS North ZDA	Hwy 11 N - Tilden LK.	50	1/3 V 1/2 H



PROJECT #: 60713279

MAPPER: P. Hebert

NAME OF WATERBODY: Unnamed trib. Tomiko R

CROSSING #: 14+408 Notman

STATION #:

DATE: DD-MMM-YY 03-MAY-24

LEGEND

- 10d depth (cm)
- 6w width m
- → Riffle
- ⇨ Run/Glide
- ⬭ Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- ⊢► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- Culvert

tree
- herbaceous / grass
- large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US South ZDA	Hwy 11 N - Tilden lake	50	1/3 V 1/2 H

PROJECT #: 60713279

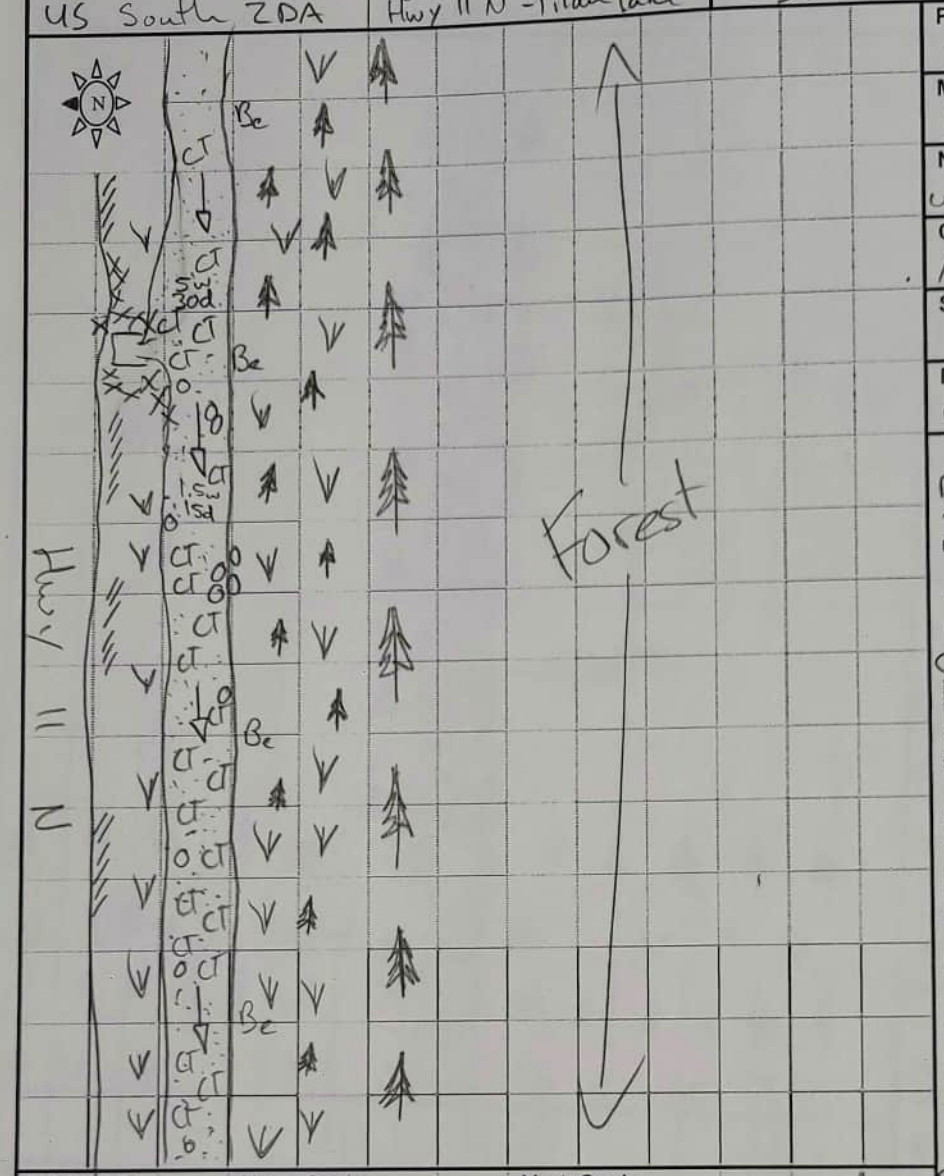
MAPPER: P. Hebert

NAME OF WATERBODY: unnamed trib to tomiko R.

CROSSING #: 14+408 Notman

STATION #:

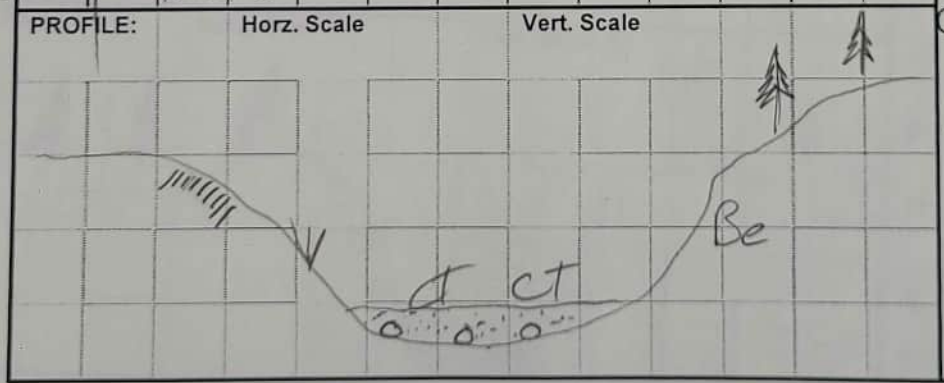
DATE: DD-MMM-YY: 03-MAY-24



LEGEND

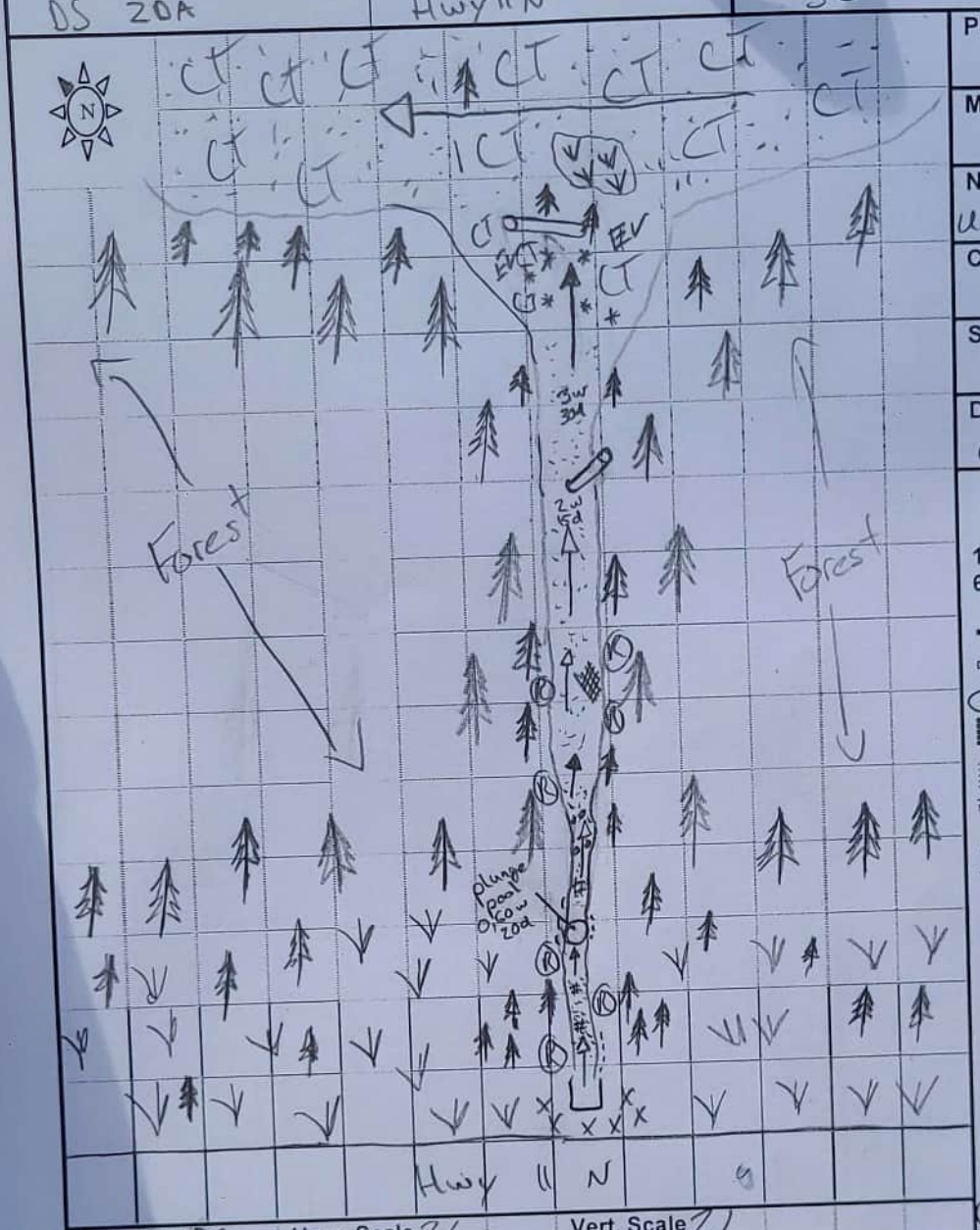
- Be - Bedrock
- 10d depth (cm)
- 6w width (m)
- ➡ Riffle
- ⇨ Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- ├► Seep/Spring
- -------- Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- Culvert

PROFILE: Horz. Scale Vert. Scale

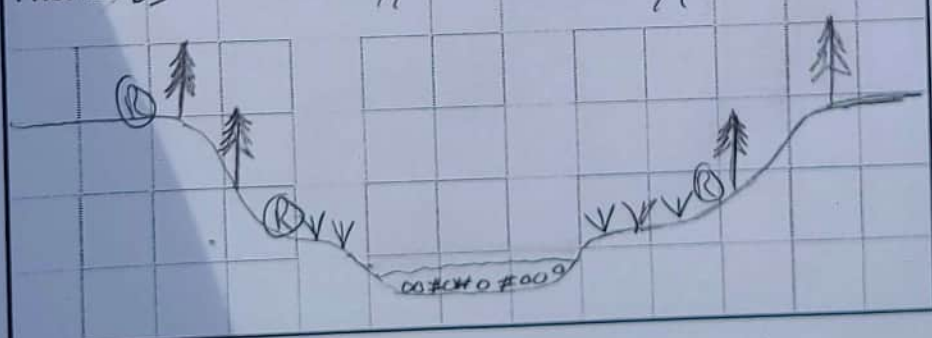


↟ tree
⩔ - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS 20A	Hwy 11 N	50	1/3 V 1/34



PROFILE: DS Horz. Scale 2/1 Vert. Scale 2/1



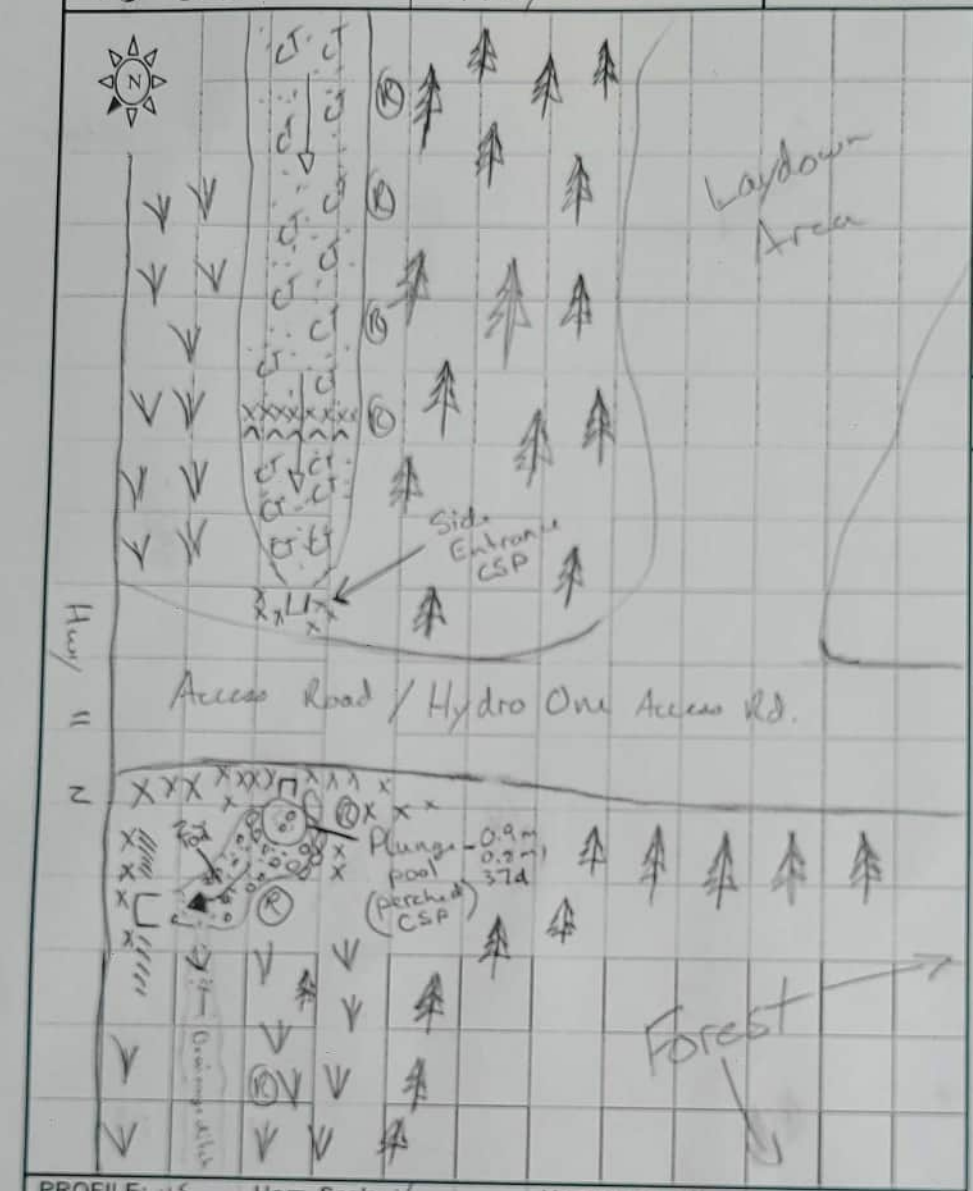
PROJECT #:	60713279
MAPPER:	P. Hébert
NAME OF WATERBODY:	Unnamed Trib. Tomiko
CROSSING #:	14+926 Nolman
STATION #:	
DATE: DD-MMM-YY	02-MAY-24

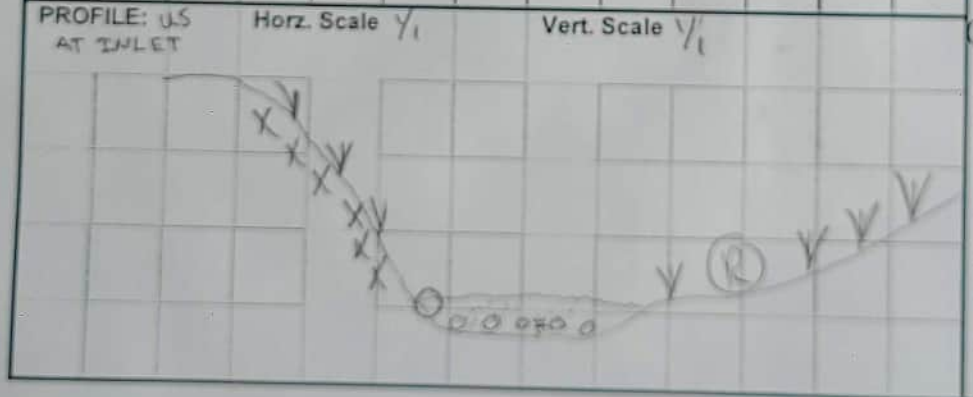
LEGEND

- 10d depth (cm)
- 6w width (m)
- ➡ Riffle
- ⇨ Run/Glide
- ⬭ Pool
- ▒ Island/Bar
- ▒ Fine Substrate
- ### Gravel Substrate
- oOooO Cobble /Boulder
- * * * Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- /////// Eroded Bank
- XXX Riprap / Other Stabilization
- ⬭ Instream Log/Tree
- ^^^ Dam/Weir/Obstruction
- ® Riparian Tree
- ⊢► Seep/Spring
- ------ Undercut Bank
- — Barrier to Fish Movement
- -S- Seasonal Barrier
- -x--x- Fence line
- ⊔ Culvert

↟ tree
⋎ - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 2DA	Hwy 11 N	20 m	½ V ½ H





PROJECT #: 607/3279

MAPPER: P. Hébert

NAME OF WATERBODY: Unnamed trib. Tomiko R.

CROSSING #: 14+926 Notman

STATION #:

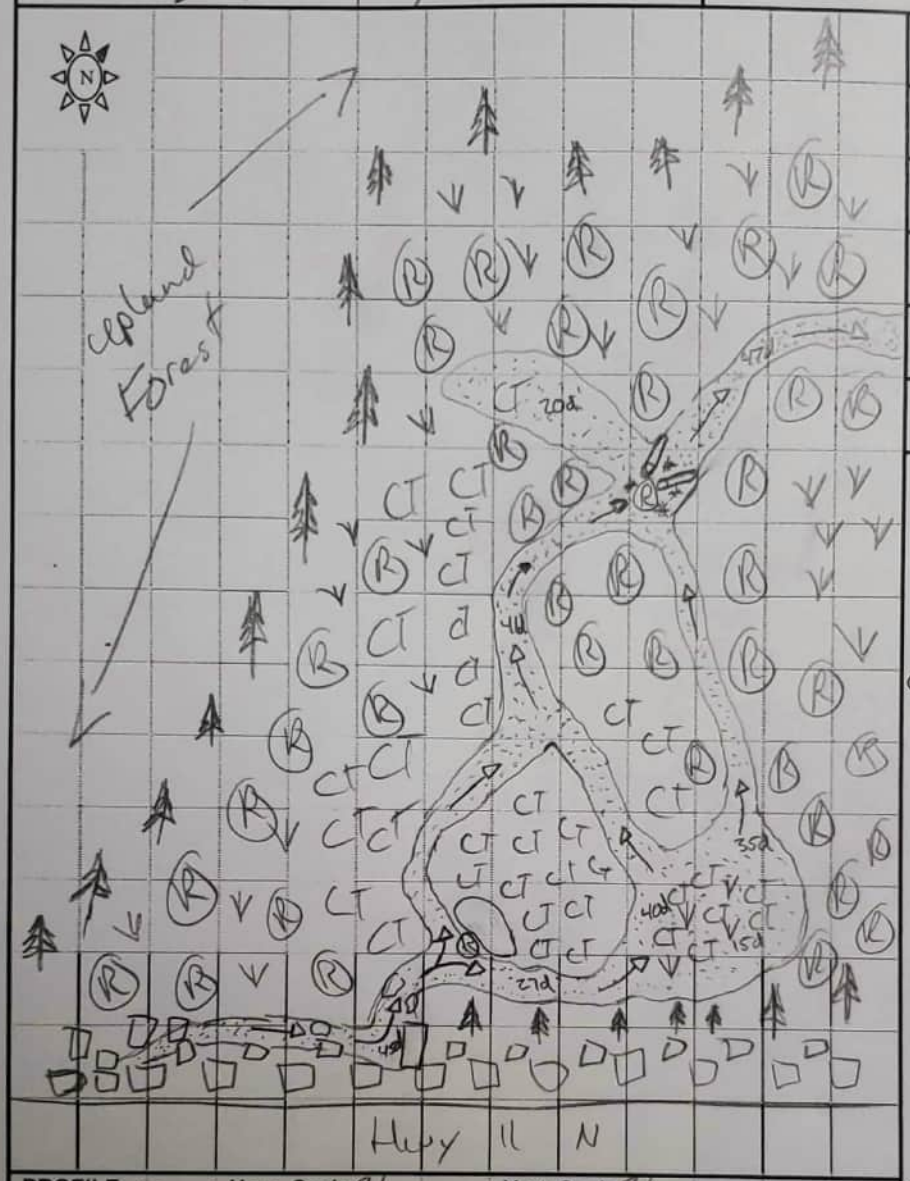
DATE: DD-MMM-YY: 02-MAY-24

LEGEND

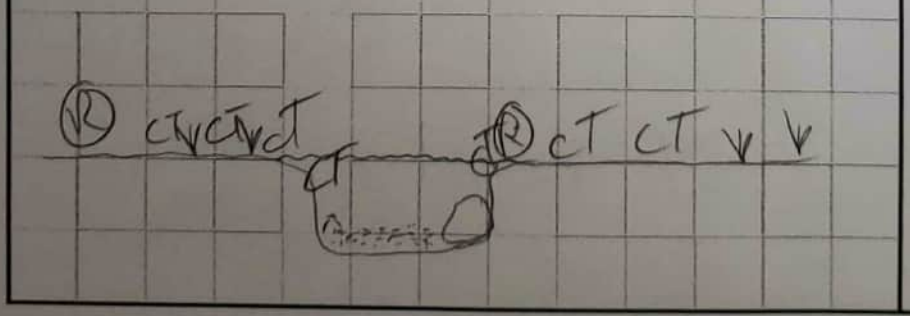
10d depth (cm)
6w width
Riffle
Run/Glide
Pool
Island/Bar
Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** Debris
CT Cattail
SV/FV Submerg/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
/////// Eroded Bank
XXX Riprap / Other Stabilization
Instream Log/Tree
^^^ Dam/Weir/Obstruction
® Riparian Tree
Seep/Spring
Undercut Bank
Barrier to Fish Movement
-S- Seasonal Barrier
-x-x- Fence line
Culvert

↑ tree
¥ - herbaceous / grass
□ - large boulder / talus [illegible]

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS (west side)	Hwy 11 N - Tilden Lk.	50 m	⅓ V ½ H



PROFILE: DS **Horz. Scale** 2/1 **Vert. Scale** 2/1



PROJECT #:	6071327
MAPPER:	P. Hubert
NAME OF WATERBODY:	Unnamed trib to Elbow Lake
CROSSING #:	16+060 Notman
STATION #:	
DATE: DD-MMM-YY	2/5/2024

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

⁘ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

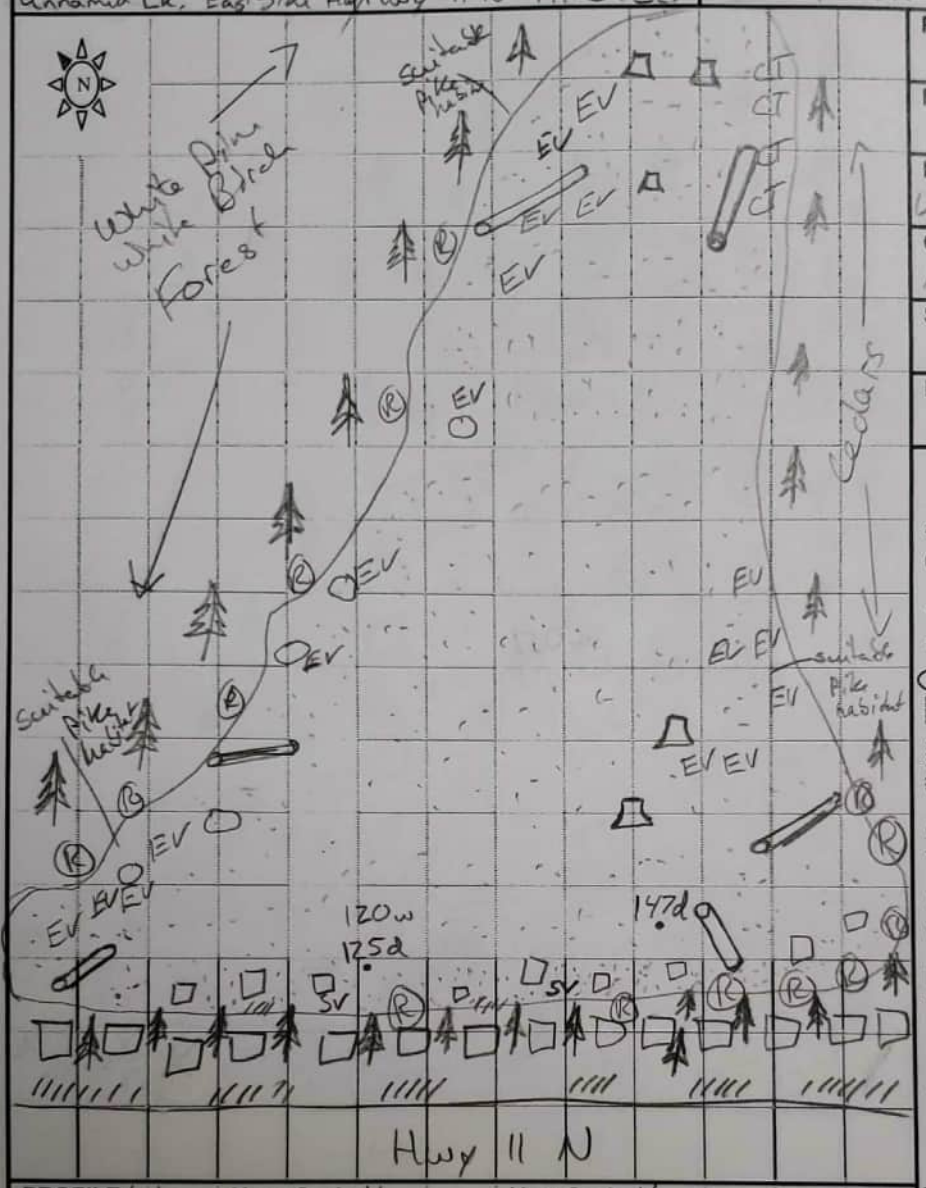
⊢► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

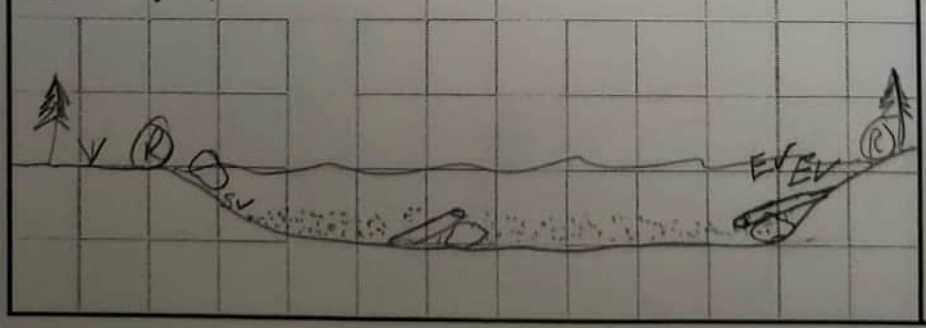
-x--x- Fence line
⊔ Culvert

↟ tree
⩛ - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Unnamed Lk. East side Hwy	Hwy 11 N - Tilden Lk.	200 m ZOA	1/15 V 1/10 H



PROFILE: Lake East side of Hwy Horz. Scale 1/10 Vert. Scale 1/3



PROJECT #:	607137279
MAPPER:	P. Hubert
NAME OF WATERBODY:	Unnamed Lk.
CROSSING #:	16+060
STATION #:	
DATE: DD-MMM-YY	06-MAY-24

LEGEND

10d depth (cm)
6w width (cm)

➡ Riffle
⇨ Run/Glide
⬭ Pool
▮ Island/Bar

▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
//////// Eroded Bank

XXX Riprap / Other Stabilization

⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

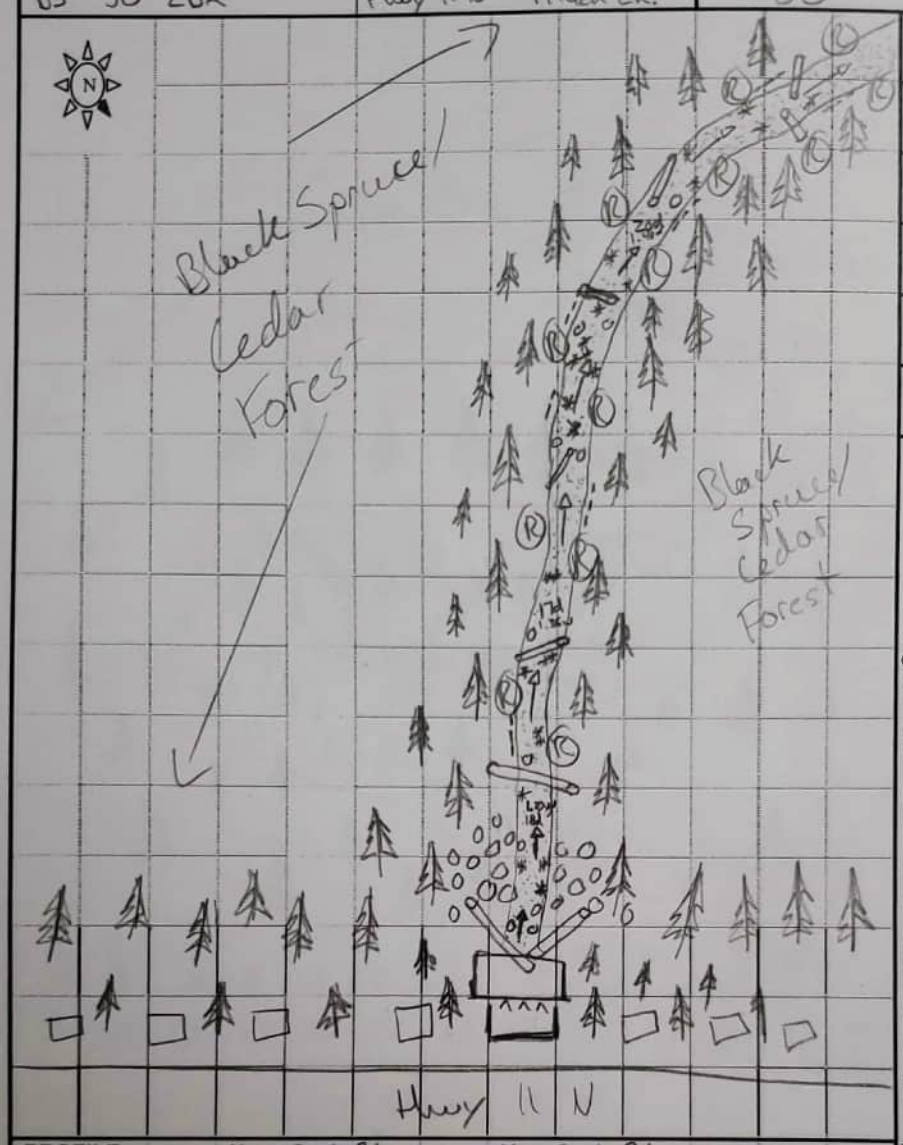
⊢► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

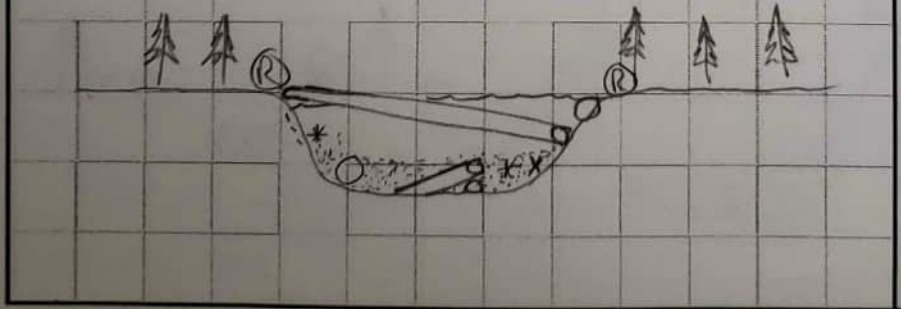
-x--x- Fence line
⌴ Culvert

↟ tree
⅄ - herbaceous / grass
□ - large boulder / blast rock
⏢ - tree stump

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
DS 50 20A	Hwy 11 N - Tilden Lk.	50	1/3 V 1/2 H



PROFILE: DS Horz. Scale 2/1 Vert. Scale 2/1



PROJECT #: G0713279
MAPPER: P. Hébert
NAME OF WATERBODY: unnamed trib. Elbow Lk.
CROSSING #: 16+278 Notman
STATION #:
DATE: DD-MMM-YY 07-MAY-24

LEGEND

10d depth (cm)
6w width (m)

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

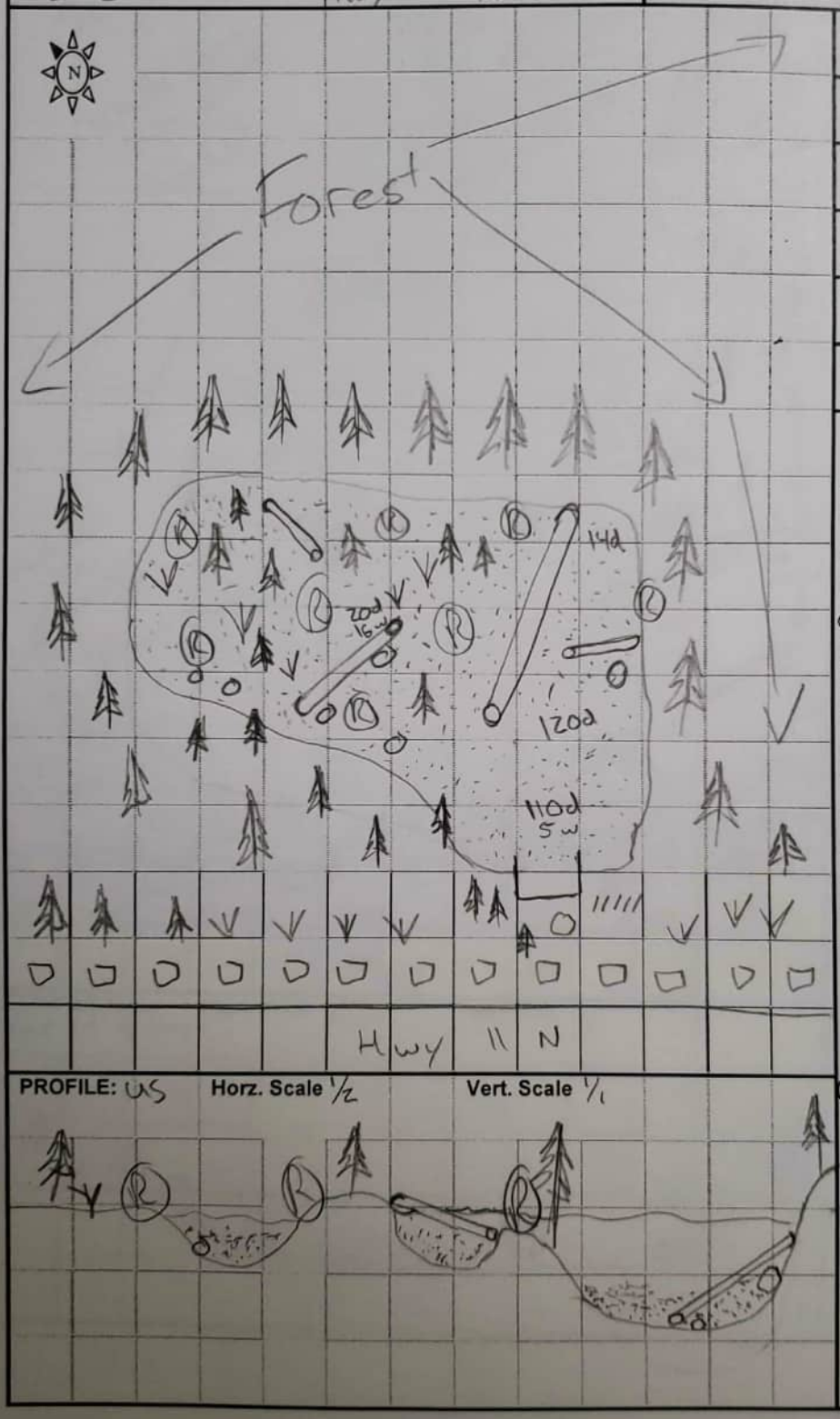
├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

↟ tree
⅄ - herbaceous / grass
□ - large boulder / blast rock

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
US 20A	Hwy 11 N - Tilden Lake	20	½ V ½ H



PROJECT #: 60713279
MAPPER: P. Hulbert
NAME OF WATERBODY: Unnamed Trib to Elbow Lake
CROSSING #: 16+278 Notman
STATION #:
DATE: DD-MMM-YY: 07-MAY-24

LEGEND

10d depth (cm)
6w width (m)

➡ Riffle
⇨ Run/Glide
⬭ Pool
▓ Island/Bar

▒ Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
/////// Eroded Bank

XXX Riprap / Other Stabilization

⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
⌴ Culvert

↟ tree
⩛ - herbaceous / grass
□ - large boulder / blast rock

Amy Ingriselli
Senior Aquatic Ecologist
Fisheries Assessment Specialist

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