Fish and Fish Habitat Existing Conditions Report - Highway 401 Planning Study from Cobourg to Colborne (GWP 4060-11-00) and Highway 401 Nagle Road Interchange Study (GWP 4059-17-00)

FINAL REPORT

Agreement 4015-E-0033

Stantec

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Sign-Off Page

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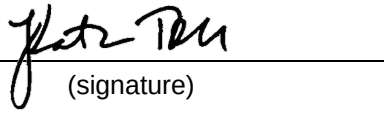
Prepared by 
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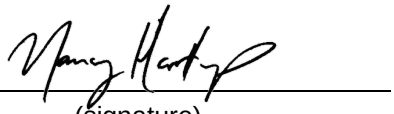
Reviewed by 
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1.0 INTRODUCTION

The Ministry of Transportation (MTO) has retained Stantec Consulting Ltd. (Stantec) to undertake a Planning, Preliminary Design, and Class Environmental Assessment (Class EA) Study on Highway 401 for the replacement and rehabilitation of structures, interchange modifications, future widening of the highway, and commuter parking lot expansions, from 2 km east of Nagle Road to Percy Street (approximately 18 km) (**Figure 1**; GWP 4060-11-00). The purpose of the study is to identify a Recommended Plan that addresses current and future transportation needs in the Study Area as part of the MTO's ongoing review of safety and operational needs for the provincial highway network. This study will include reviewing existing conditions, developing and evaluating alternatives, identifying appropriate improvements, and developing environmental protection / mitigation measures. A Recommended Plan will be confirmed and designated (protected) at the completion of the study.

The MTO and the Town of Cobourg have also retained Stantec to undertake a Planning, Preliminary Design, and Class EA Study on Highway 401 for a new interchange near Nagle Road in the Town of Cobourg and the Township of Hamilton. This study is being completed concurrently with the Highway 401 Planning Study from Cobourg to Colborne. Therefore, the Nagle Road interchange Study Area is also covered in this report (**Figure 1**; GWP 4059-17-00).

This *Fish and Fish Habitat Existing Conditions Report* provides supporting documentation for the project and describes fish communities and fish habitat in both Study Areas (**Figure 2** in **Appendix A**). This report was completed in accordance with the *Environmental Reference for Highway Design* (MTO 2013) and the *Environmental Guide for Fish and Fish Habitat* (MTO 2009). Terrestrial environment features for this project are described in a separate report (Stantec 2018).

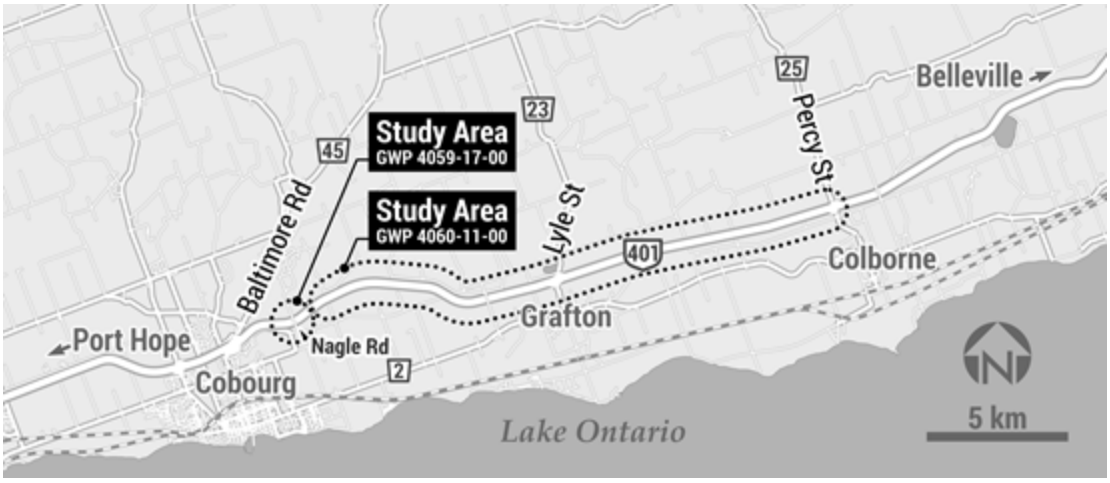

Figure 1: Location of Study Areas

2.0 METHODS

2.1 BACKGROUND DATA

2.1.1 Agency Consultation

The Study Areas are located within the jurisdiction of the Peterborough District of the Ministry of Natural Resources and Forestry (MNRF). The MNRF was consulted in May 2017, during the process of requesting a Licence to Collect Fish for Scientific Purposes, and again in April 2018, as part of the official project notification. Agency correspondence and background data are provided in **Appendix B**.

2.1.2 Secondary Source Data Collection

Additional information was obtained from the following sources:

- MNRF's Land Information Ontario (LIO) database – to identify mapped watercourses and associated thermal regimes, where available (MNRF 2018a).
- MNRF's Natural Heritage Information Centre's (NHIC) Biodiversity Explorer database – to determine if significant natural features or significant species have been documented in the Study Areas (MNRF 2018b).
- MNRF's constructed drains digital dataset – to identify mapped drains and associated drain classes assigned by Fisheries and Oceans Canada (DFO), where applicable (MNRF 2018c).
- DFO mapping of aquatic species at risk – to determine if fish or freshwater mussel species at risk have been documented in the Study Areas (DFO 2018).

2.2 FIELD INVESTIGATIONS

Fish and fish habitat field investigations were conducted June 13 to June 16, 2017 (spring survey) and September 18 to September 21, 2017 (summer survey). The purpose of the field work was to document aquatic ecological conditions in the Study Areas. Aquatic habitat characterization and fisheries inventories were overseen by a RAQS-qualified Fisheries Specialist who is a certified Class 2 Electrofishing Crew Leader.

2.2.1 Habitat Assessment

Field investigations were conducted according to the *Environmental Reference for Highway Design* (MTO 2013) and the *Environmental Guide for Fish and Fish Habitat* (MTO 2009). For the habitat assessment, an MTO Watercourse Field Record Form and MTO Fish Habitat Mapping Form were completed.
Due to restricted land access, habitat surveys were confined to the MTO right-of-way (RoW). *In situ* water quality parameters (dissolved oxygen, conductivity, pH and temperature) were measured at the time of the field surveys and site photographs were taken.

2.2.2 Fisheries Inventory

A Licence to Collect Fish for Scientific Purposes was obtained from the Peterborough District MNRF and fish collections were conducted using minnow traps and a backpack electrofisher. All fish captured were identified to species, enumerated, and released alive at the site of capture.

2.2.3 Aquatic Species at Risk

The potential for aquatic species at risk to occur in the Study Areas was evaluated based on a review of background information, including agency consultation and secondary source data.

3.0 EXISTING CONDITIONS

3.1 BACKGROUND DATA

Potential watercourse crossings were identified through background data review (MNRF 2018a; MNRF 2018c), totaling 17 crossings with the potential to provide fish habitat. Through a combination of data sources, the thermal regime or DFO drain class (which can include flow and thermal regime) was available for most watercourse crossings in the Study Areas. Many of the mapped watercourses have been classified as Type D Drains (permanent coldwater, sensitive species present) (MNRF 2018a). The MNRF provided a coldwater in-water construction timing window for most watercourses, which protects both spring and fall spawning species (MNRF 2018d).

One aquatic species at risk, American Eel (*Anguilla rostrata*), has been recorded in the Study Areas. The record for this species is from Shelter Valley Creek (MNRF 2017; MNRF 20018b; MNRF 2018d; MNRF 2018e). American Eel is an Endangered species, protected by *Ontario's Endangered Species Act, 2007* (ESA 2007). Additionally, Silver Lamprey (*Ichthyomyzon unicuspis*) (MNRF 2018d; MNRF 2018e) and Northern Brook Lamprey (*Ichthyomyzon fossor*) (MNRF 2018b) have been recorded in the Study Areas; however, as Special Concern species, neither Silver Lamprey nor Northern Brook Lamprey are afforded protection under the ESA, 2007.

Another aquatic species at risk was identified within 5 km from the Study Areas (MNRF 2018d; MNRF 2018e). Lake Sturgeon (*Acipenser fulvescens*) are present in Lake Ontario, but there are no records for the species, and no suitable habitat, in the Study Areas. In the Great Lakes, Lake Sturgeon is an Endangered species, protected by the ESA, 2007.

3.2 FIELD INVESTIGATIONS

Existing fish and fish habitat information is summarized below. Stations where fish and fish habitat data were collected are illustrated in **Figure 2** (**Appendix A**). Photographic records of the spring and summer surveys are included **Appendix C1** and **C2**, respectively. Field data sheets for the spring and summer surveys are included in **Appendix D1** and **D2**, respectively.

Tabular summaries of existing conditions for fish and fish habitat and *in situ* water quality data are provided in **Table 3-1** and **3-2**, respectively. Among the 17 potential watercourse crossings investigated within the Study Areas, fish habitat was documented at 16 sites. The majority of watercourse crossings in the Study Areas are natural, coldwater watercourses that generally drain southerly to Lake Ontario and provide Brook Trout habitat. Many of these watercourses have also been classified as a Type D Drain (permanent coldwater, sensitive species present) (MNRF 2018a).

Thirteen common fish species were captured during the 2017 surveys (**Table 3-1**); the most common species were: Brook Trout (*Salvelinus fontinalis*), Rainbow Trout (*Oncorhynchus mykiss*), Creek Chub (*Semotilus atromaculatu*) and Blacknose Dace (*Rhinichthys atratulus*).

A summary of *in situ* water quality parameters is provided in **Table 3-2**.

Unnamed Tributary 0A / Midtown Creek East

During the spring survey, upstream habitat consisted of a flat over fine substrates flowing through the surrounding cedars. At the fence marking the RoW, a cascade approximately 0.45 m high created a plunge pool below that was underlain with clay. Within the RoW, flow continued to the culvert as a riffle over riverstone and was approximately 2.5 m wide and 0.05 m deep. During the summer survey, the upstream reach was dry.

During spring, downstream habitat consisted of a cobble lined riffle-pool sequence ranging from 1 m to 1.6 m wide and 0.05 m to 0.3 m deep. During summer, a trickle flow was observed from the culvert. A fish community survey was not conducted at this location; however, a cyprinid species was observed in the plunge pool on the upstream side of the crossing (**Table 3-1**).

Unnamed Tributary 0B / Brook Creek West

Upstream habitat consisted of a run over silt and sand substrates, transitioning to a run-riffle that was approximately 2.5 m wide and 0.3 m deep and underlain with riverstone. Downstream, a run-riffle sequence, approximately 2.5 m wide and 0.05 m to 0.3 m deep, flowed over gravel, cobble and fine substrates. A fish community survey was not conducted at this location; however, a cyprinid species was observed on the downstream side of the crossing (**Table 3-1**).

Unnamed Tributary 0C / Brook Creek East

Upstream habitat consisted of a trickle flow through dense watercress and cattails with no observable channel. Downstream, a pool approximately 1.5 m wide and 0.1 m deep was underlain with silt, gravel and muck substrates. Dense watercress was growing within the watercourse approximately 3 m from the culvert. Beyond the fence at the RoW boundary, the watercourse drains to the west and is approximately 1.5 m wide. A fish community survey was not conducted at this location; however, a school of cyprinids was observed in the downstream pool (**Table 3-1**).

Unnamed Tributary 01

Upstream habitat consisted of a large riffle, approximately 2 m wide and 0.15 m deep, flowing down gradient over boulder and cobble substrates. Downstream habitat consisted of a riffle-pool-riffle-pool-run-cascade sequence, approximately 1 m to 3 m wide and 0.15 m to 0.45 m deep, over gravel and sand substrates. Brook Trout were captured during the fish community surveys (**Table 3-1**).

Unnamed Tributary 02

Due to a lack of property access and surrounding dense cedars, an assessment of upstream habitat was not conducted. Habitat downstream of the crossing consisted of a large pool, approximately 4.5 m wide and 0.8 m deep, that transitioned to a run that ranged between 1.8 m to 2 m wide and 0.25 m deep. A short

riffle was situated at the fence along the RoW. A large seep was located on the downstream east bank and a groundwater upwelling was observed near the west bank. Brook Trout and Rainbow Trout were captured during the spring and summer fish community surveys (**Table 3-1**).

Unnamed Tributary 03

Upstream habitat consisted of a cattail wetland to the west of the culvert, which contributed a trickle flow approximately 0.5 m wide and 0.01 m to 0.02 m deep. A channelized feature drained from the east approximately 400 m along the RoW. During the spring survey, the channel was approximately 1 m wide and 0.05 m deep; however, it was dry during the summer survey. Several headcuts (i.e., erosional features consisting of an abrupt vertical drop) were observed in the channel, which would prevent upstream fish movement for non-jumping fish species.

The culvert was perched, approximately 1.6 m high, and would be a barrier to upstream fish movement. Downstream habitat consisted of a large plunge pool at the culvert, which transitioned into a riffle-cascade-run sequence approximately 1 m wide and 0.08 m deep. Brook Stickleback (*Culaea inconstans*), Creek Chub, Fathead Minnow (*Pimephales promelas*) and Rainbow Trout were captured downstream of the culvert during the fish community survey (**Table 3-1**).

Unnamed Tributary 04

Upstream habitat consisted of a wide riffle over boulder and cobble substrates, which transitioned into a pool-run sequence just upstream of the culvert. During the spring survey, wetted width ranged from 4 m to 8 m and wetted depth ranged from 0.1 m to 0.7 m. Watercress and iron staining were observed on the upstream side of the culvert, and are indicators of potential groundwater upwelling.

A grade control structure within the culvert was composed of a series of large concrete ledges across the full width of the culvert, some of which appeared to be undermined. During low flow, the concrete ledges would prevent fish passage for non-jumping fish species. Downstream of the culvert, a riffle-pool-run sequence, approximately 4 m wide and 0.2 m to 0.5 m deep, flowed over gravel, sand and cobble substrates. Rainbow Trout, Central Mudminnow (*Umbra limi*) and a lamprey ammocoete were captured during the fish community survey (**Table 3-1**).

Unnamed Tributary 05

This mapped drainage feature originates south of the highway RoW (MNRF 2018c). Due to a lack of property access, it was not surveyed during Stantec's spring or summer field investigations.

Unnamed Tributary 06

Upstream habitat consisted of a run over fine substrates with slumping banks observed on the east side. Highway drainage, comprised of a trickle flow, was observed flowing down the east rip rap lined embankment. Downstream habitat consisted of a plunge pool-run-cascade-run sequence, approximately 2 m wide and 0.1 m to 0.7 m deep. The downstream end of the culvert was perched approximately 0.55 m

and would be a barrier to upstream fish movement. Additionally, a woody debris jam (located downstream of the culvert, at the fence at the RoW boundary) would likely impede, but not prevent, fish passage during low flow. Brook Trout were captured during the fish community surveys (**Table 3-1**).

Shelter Valley Creek

Upstream and downstream habitat consisted of a riffle-run sequence over boulder, cobble and gravel substrates. During the spring and summer survey, wetted width and depth ranged between 6 m to 8 m and 0.2 m to 0.6 m, respectively. Undercut banks and overhanging riparian vegetation provided cover for small-bodied fish.

Downstream of the culvert, watercress was observed. A large meander bend in the channel exhibited slumping, unstable banks on the west side of the creek. Rainbow Trout, Mottled Sculpin (*Cottus bairdii*), and young-of-year salmonid and a lamprey ammeocete were captured, and Chinook Salmon (*Oncorhynchus tshawytscha*) were observed during the fish community survey (**Table 3-1**).

Unnamed Tributary 07

Upstream habitat consisted of a riffle-run sequence over cobble, gravel and boulder substrates. During the spring survey, the tributary ranged from 0.6 m to 1.6 m wide and 0.1 m to 0.3 m deep. Downstream habitat consisted of a riffle, approximately 1.2 m wide and 0.15 m deep, flowing over cobble, boulder and gravel substrates. South of the RoW, the tributary was surrounded by dense cedar trees. Highway drainage, comprised of a trickle flow, was observed flowing down the rip rap lined embankment. Watercress was observed both upstream and downstream of the culvert, an indicator of possible groundwater upwelling. Blacknose Dace (*Rhinichthys atratulus*) was captured and a salmonid species was observed during the fish community survey (**Table 3-1**).

Unnamed Tributary 08

Based on MNRF mapping (MNRF 2018a), upstream flow originates from the east along Rutherford Road. However, based on Stantec's field investigations, the main source of the upstream flow appeared to originate from the east side of Vernonville Road. During the spring, a flat was observed, approximately 1.8 m wide and 0.01 m to 0.02 m deep, with a small pool immediately upstream of the catch basin.

Downstream of the bridge, flow from the upstream catch basin discharges from a culvert into a small pool. Downstream of the pool, habitat consisted of a run that ranged between 0.4 m to 1.1 m wide and 0.09 m to 0.15 m deep during the spring survey. Flow continued downstream, beyond the RoW, as a flat through grassy vegetation. During the summer survey, the tributary was dry both upstream and downstream of the bridge. No fish were captured during the spring fish community survey (**Table 3-1**).

Unnamed Tributary 09

Upstream habitat consisted of a run-riffle-pool sequence, approximately 3 m wide and 0.25 m deep, over cobble, gravel and sand substrates. Downstream habitat consisted of a wide, deep pool underlain with sand that transitioned to a run over sand and boulder substrates. During the spring survey, the tributary ranged between 3 m and 5 m wide and 0.1 m to 0.8 m deep.

Downstream of the bridge, beyond the RoW, the watercourse narrowed to form a riffle over cobble and gravel substrates. Iron staining was observed on the east side of the tributary. White Sucker (*Catostomus commersonii*), Creek Chub, Blacknose Dace and Brook Trout were captured during the fish community surveys (**Table 3-1**).

Unnamed Tributary 10

Upstream habitat consisted of a narrow, slightly meandering run, approximately 0.7 m wide and 0.15 m deep and underlain by sand substrates and drained within a grassy RoW. A scour, approximately 0.35 m deep, was observed along a meander bend located just upstream of the culvert.

Downstream habitat consisted of a large, square shaped pool, approximately 5 m wide and 0.7 m deep. Flow continued westerly, along the south side of the fence at the RoW boundary through a narrow channel, approximately 1.7 m wide and 0.18 m deep. Watercress was observed downstream of the fence at the RoW boundary. Creek Chub and Blacknose Dace were captured during the fish community survey (**Table 3-1**).

Unnamed Tributary 11

During the spring survey, upstream habitat consisted of a trickle flow through muck and detritus with no defined channel. A seep, ranging from 0.1 m to 0.3 m wide and 0.01 m to 0.03 m deep, was observed approximately 15 m east of the culvert. Downstream, a trickle flow, 0.3 m wide and 0.06 m deep, was observed in the dense cattails surrounding the culvert. Flow continued south to the fence at the RoW boundary where it turned 90 degrees to the east and then south through the adjacent trees. Downstream of the fence at the RoW boundary, the flow appeared channelized and was approximately 0.5 m wide and 0.5 m deep.

During the summer field investigation, the watercourse was dry both upstream and downstream of the culvert. Too little water was present in the channel during the spring field investigation to complete a fish community survey (**Table 3-1**).

Unnamed Tributary 12

Upstream habitat consisted of a riffle-run sequence, approximately 1.2 m to 2.6 m wide and 0.15 m deep, over coarse substrates. Additionally, drainage from the highway was observed flowing down the steep, rip rap lined embankment and has resulted in some erosion of the embankment.

Downstream habitat consisted of a scour/plunge pool at the culvert that transitioned into a run-riffle over coarse substrates. A seep was observed approximately 5 m east of the tributary at an old culvert found in the embankment. Brook Trout, Fathead Minnow and Creek Chub were captured during the fish community survey (**Table 3-1**).

Unnamed Tributary 13

Upstream of the fence at the RoW boundary, dense in-stream grassy vegetation and cattails obscured visibility of the channel. Within the RoW, habitat consisted of a riffle over cobble and gravel substrates in a concrete lined channel. Flow continued into a large catch basin and under the highway.

Downstream of the crossing, flow continued through a concrete lined channel, over a concrete apron and into a plunge pool approximately 0.7 m deep. Flow continued downstream through the Percy Street interchange in a channel, ranging from 0.8 m to 1.2 m wide and 0.05 m to 0.1 m deep, underlain with boulder, gravel and sand substrates. At the south end of the interchange, flow continued through a concrete box culvert and into a small wetland beyond the RoW. Blacknose Dace, Creek Chub and Northern Redbelly Dace (*Chrosomus eos*) were captured during the fish community surveys (**Table 3-1**).

Table 3-1: Summary of Fish and Fish Habitat Existing Conditions during Spring and Summer 2017; GWP 4060-11-00 and GWP 4059-17-00

Waterbody	Flow Regime	Thermal Regime	DFO Drain Classification*	Habitat Description	Fish Habitat Commercial Recreational or Aboriginal (CRA) Fishery	Fish Species Present	Substrate Type	Riparian and Instream Vegetation	Constraints and Opportunity	Important, Exceptional Fish Habitat	In-water Works Timing Window
Unnamed Tributary 0A / Midtown Creek East	Intermittent (based on Stantec's 2017 field investigations)	Unknown	Type D	Upstream: flat over fine substrates, cascade at RoW fence with a 0.45 m drop into plunge pool with clay substrates and eroded banks. Flow continues as a riffle over riverstone to the culvert, approximately 2.5 m wide and 0.05 m deep. Dry during the summer. Downstream: cobble lined riffle/pool sequence 1 m to 1.6 m wide and 0.05 m to 0.3 m deep. Recently reconstructed channel from culvert to RoW fence. Trickle flow during the summer from culvert seepage.	CRA Fishery	Stantec: cyprinid sp. observed	Clay, cobble, silt, sand, detritus and riverstone	Riparian Vegetation: mixed forest Instream Vegetation: *Juncus*, cattails and grasses	Address barrier to fish movement (cascade at upstream RoW fence)	Yes (coldwater thermal regime) Iron staining on both upstream and downstream side	To be confirmed with MNRF (information has been requested and will be documented in the Impact Assessment Report)
Unnamed Tributary 0B / Brook Creek West	Permanent (based on Stantec's 2017 field investigations)	Cold (MNRF 2018d)	Type D	Upstream: habitat within the RoW consisted of run-riffle habitat approximately 2.5 m wide and 0.3 m deep and underlain with riverstone. Beyond RoW, habitat consisted of run over silt and sand substrates. Downstream: run-riffle sequence approximately 2.5 m wide and 0.05 m to 0.3 m deep over gravel, cobble and fine substrates. Cyprinids observed at culvert.	CRA Fishery	Stantec: cyprinid sp. observed MNRF (2018d): Brook Stickleback, Brook Trout, Common Shiner, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Johnny Darter/Tesselated Darter, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Rainbow Trout, White Sucker	Cobble, gravel, sand, silt and muck	Riparian Vegetation: cedar Instream Vegetation: cattails, bulrush and speedwell	None	Yes (coldwater thermal regime) Iron staining and watercress observed on the downstream side	July 1 to Sept 30 (MNRF 2018d)
Unnamed Tributary 0C / Brook Creek East	Permanent (based on Stantec's 2017 field investigations)	Cold (MNRF 2018d)	Unknown	Upstream: trickle flows through dense watercress and cattails, no observable channel Downstream: pool at culvert approximately 1.5 m wide and 0.1 m deep with silt, gravel and muck substrates. Dense watercress 3 m beyond the culvert to the RoW fence. Beyond RoW, channel flows to the west and is 1.5 m wide	CRA Fishery	Stantec: cyprind sp. observed MNRF (2018d): Brook Stickleback, Brook Trout, Common Shiner, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Johnny Darter/Tesselated Darter, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Rainbow Trout, White Sucker	Sand, gravel and muck	Riparian Vegetation: cedars Instream Vegetation: dense watercress	None	Yes (coldwater thermal regime) Dense watercress upstream and downstream of the culvert	July 1 to Sept 30 (MNRF 2018d)

Table 3-1: Summary of Fish and Fish Habitat Existing Conditions during Spring and Summer 2017; Highway 401 Cobourg to Colborne

Waterbody	Flow Regime	Thermal Regime	DFO Drain Classification*	Habitat Description	Fish Habitat Commercial Recreational or Aboriginal (CRA) Fishery	Fish Species Present	Substrate Type	Riparian and Instream Vegetation	Constraints and Opportunity	Important, Exceptional Fish Habitat	In-water Works Timing Window
Unnamed Tributary 01	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Type D	Upstream: large riffle flowing down gradient over boulder/cobble substrates, approximately 2 m wide and 15 cm deep. Downstream: riffle/pool/riffle/pool/run/cascade sequence over gravel and sand substrates, approximately 1 m to 3 m wide and 15-45 cm deep	CRA Fishery	Stantec: Brook Trout MNRF (2017; 2018d): Brook Trout, Creek Chub, Eastern Blacknose Dace, Longnose Dace, Rainbow Trout, White Sucker	Boulder, cobble, gravel and sand	Riparian Vegetation: cedars Instream Vegetation: none	None	Yes (coldwater thermal regime) Iron Staining upstream and downstream - possible groundwater input for Brook Trout spawning	July 1 to Sept 30 (MNRF 2018d)
Unnamed Tributary 02	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Type D	Upstream: no access, dense cedars Downstream: large pool 4.5 m wide and 80 cm deep at culvert, school of Brook Trout observed, narrows to a run 1.8 m to 2 m wide and 25 cm deep and a riffle at RoW fence approximately 2 m wide. Large seep observed immediately downstream on the east bank.	CRA Fishery	Stantec: Brook Trout, Rainbow Trout MNRF (2017; 2018d): Brook Trout, Creek Chub, Eastern Blacknose Dace, Longnose Dace, Rainbow Trout, White Sucker	Cobble, gravel, sand, silt, muck and detritus	Riparian Vegetation: cedars Instream Vegetation: tapegrass and cattails	None	Yes (coldwater thermal regime) Iron Staining and watercress downstream - possible groundwater input for Brook Trout spawning	July 1 to Sept 30 (MNRF 2018d)
Unnamed Tributary 03	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Unknown	Upstream: trickle flow from cattails to the west, 0.5 m wide and 1 cm to 2 cm deep. A channelized feature drains west along the edge of the RoW approximately 400 m to the highway culvert. During the spring the feature was 1 m wide and 5 cm deep and dry during the summer field investigation. Several headcuts located along the feature would prevent upstream fish movement. Downstream: large plunge pool at culvert, followed by a riffle/cascade/run sequence approximately 1 m wide and 8 cm deep.	CRA Fishery	Stantec: Brook Stickleback, Creek Chub, Fathead Minnow, Rainbow Trout MNRF (2017; 2018d): American Brook Lamprey, Atlantic Salmon, Black Crappie, Bluntnose Minnow, Brook Trout, Brown Bullhead, Brown Trout, Central Mudminnow, Coho Salmon, Common Shiner, Creek Chub, Eastern Blacknose Dace, Emerald Shiner, Fantail Darter, Fathead Minnow, Johnny Darter/Tesselated Darter, Longnose Dace, Northern Brook Lamprey, Northern Hog Sucker, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, Sea Lamprey, Smallmouth Bass, Stonecat, White Sucker	Clay, silt, cobble, boulder and gravel	Riparian vegetation: mixed forest Instream Vegetation: watercress, cattails and *Phragmites*	Address perched culvert (approximately 1.6 m high) Stabilize collapsed embankment on downstream side	Yes (coldwater thermal regime) Iron staining at downstream culvert and watercress upstream Groundwater upwelling observed just downstream of the culvert on the right side	July 1 to Sept 30 (MNRF 2018d)

Table 3-1: Summary of Fish and Fish Habitat Existing Conditions during Spring and Summer 2017; Highway 401 Cobourg to Colborne

Waterbody	Flow Regime	Thermal Regime	DFO Drain Classification*	Habitat Description	Fish Habitat Commercial Recreational or Aboriginal (CRA) Fishery	Fish Species Present	Substrate Type	Riparian and Instream Vegetation	Constraints and Opportunity	Important, Exceptional Fish Habitat	In-water Works Timing Window
Unnamed Tributary 04	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Type D	Upstream: riffle over boulder/cobble substrates, which transitions to a pool-run sequence at the culvert. Wetted width ranged from 4 m to 8 m wide and 0.1 m to 0.7 m deep. Downstream: riffle-pool-run sequence over gravel, sand and cobble substrates, approximately 4 m wide and 0.2 m to 0.5 m deep. Culvert - a grade control structure in the culvert consists of large concrete ledges across the full width of the culvert that during normal or low flow would prevent fish passage for non-jumping species.	CRA Fishery	Stantec: Rainbow Trout, Central Mudminnow, lamprey ammocoete MNRF (2017; 2018d): American Brook Lamprey, Atlantic Salmon, Black Crappie, Bluntnose Minnow, Brook Trout, Brown Bullhead, Brown Trout, Central Mudminnow, Coho Salmon, Common Shiner, Creek Chub, Eastern Blacknose Dace, Emerald Shiner, Fantail Darter, Fathead Minnow, Johnny Darter/Tesselated Darter, Longnose Dace, Northern Brook Lamprey, Northern Hog Sucker, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, Sea Lamprey, Smallmouth Bass, Stonecat, White Sucker	Gravel, cobble, sand and boulder	Riparian Vegetation: mixed forest Instream Vegetation: none	Address barrier to fish movement (grade control system in the culvert consists of large concrete ledges across the full width of the culvert that during low flow would prevent fish passage for non-jumping species)	Yes (coldwater thermal regime) Watercress and iron staining upstream side of culvert.	July 1 to Sept 30 (MNRF 2018d)
Unnamed Tributary 05	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Unknown	Upstream and Downstream: not assessed as it is not located within Highway 401 RoW	CRA Fishery	Stantec: not fished; not located within Highway 401 RoW MNRF (2017; 2018d): American Brook Lamprey, Atlantic Salmon, Black Crappie, Bluntnose Minnow, Brook Trout, Brown Bullhead, Brown Trout, Central Mudminnow, Coho Salmon, Common Shiner, Creek Chub, Eastern Blacknose Dace, Emerald Shiner, Fantail Darter, Fathead Minnow, Johnny Darter/Tesselated Darter, Longnose Dace, Northern Brook Lamprey, Northern Hog Sucker, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, Sea Lamprey, Smallmouth Bass, Stonecat, White Sucker	N/A	N/A	N/A	N/A	July 1 to Sept 30 (MNRF 2018d)

Table 3-1: Summary of Fish and Fish Habitat Existing Conditions during Spring and Summer 2017; Highway 401 Cobourg to Colborne

Waterbody	Flow Regime	Thermal Regime	DFO Drain Classification*	Habitat Description	Fish Habitat Commercial Recreational or Aboriginal (CRA) Fishery	Fish Species Present	Substrate Type	Riparian and Instream Vegetation	Constraints and Opportunity	Important, Exceptional Fish Habitat	In-water Works Timing Window
Unnamed Tributary 06	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Type D	Upstream: run over fine substrates, slumping bank on east side. Trickle flow from constructed drainage feature on east side. Downstream: plunge pool-run-cascade-run sequence approximately 2 m wide and 0.1 m to 0.7 m deep. Woody debris jam at RoW fence that would impede fish passage.	CRA Fishery	Stantec: Brook Trout MNRF (2017; 2018d): Mudminnows, Sticklebacks, Brook Stickleback, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Johnny/Tesselated Darter, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Trout, Threespine Stickleback, White Sucker	Sand, silt, gravel, muck, boulder and cobble	Riparian Vegetation: mixed forest Instream Vegetation: watercress and speedwell	Address perched culvert (0.55 m high) on downstream side Stabilize slumping banks on upstream side Retain root wads and woody debris on the downstream side Limit riparian tree removal	Yes (coldwater thermal regime) Watercress on upstream and downstream side	July 1 to Sept 30 (MNRF 2018d)
Shelter Valley Creek	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	N/A	Upstream and Downstream: riffle-run sequence over boulder, cobble and gravel substrates. Wetted width ranged between 6 m and 8 m and depth ranged between 0.2 m and 0.6 m.	CRA Fishery	Stantec: Rainbow Trout, Mottled Sculpin, YOY salmonid, lamprey ammocoete, and Chinook Salmon observed MNRF (2017; 2018d): American Eel, Atlantic Salmon, Chinook Salmon, Black Bullhead, Bluegill, Bluntnose Minnow, Brook Stickleback, Brook Trout, Brown Bullhead, Brown Trout, Central Mudminnow, Coho Salmon, Common Shiner, Creek Chub, Eastern Blacknose Dace, Emerald Shiner, Fantail Darter, Fathead Minnow, Finescale Dace, Golden Shiner, Johnny Darter/Tesselated Darter, Largemouth Bass, Logperch, Longnose Dace, Mottled Sculpin, Northern Brook Lamprey, Northern Hog Sucker, Northern Redbelly Dace, Pumpkinseed, Rainbow Trout, Rock Bass, Sea Lamprey, Smallmouth Bass, Spottail Shiner, Threespine Stickleback, White Sucker, Yellow Perch	Cobble, boulder, gravel and sand	Riparian Vegetation: mixed forest Instream Vegetation: none	Stabilize downstream west bank at meander bend	Yes (coldwater thermal regime) Watercress and iron staining	July 1 to Sept 30 (MNRF 2018d)

Table 3-1: Summary of Fish and Fish Habitat Existing Conditions during Spring and Summer 2017; Highway 401 Cobourg to Colborne

Waterbody	Flow Regime	Thermal Regime	DFO Drain Classification*	Habitat Description	Fish Habitat Commercial Recreational or Aboriginal (CRA) Fishery	Fish Species Present	Substrate Type	Riparian and Instream Vegetation	Constraints and Opportunity	Important, Exceptional Fish Habitat	In-water Works Timing Window
Unnamed Tributary 07	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Type E	Upstream: riffle-run sequence over cobble, gravel and boulder substrates, 0.6 m to 1.6 m wide and 0.1 m to 0.3 m deep. Downstream: riffle approximately 1.2 m wide and 0.15 m deep over cobble, boulder and gravel substrates. Flows into dense cedar bush beyond RoW. Highway drainage down west riprap lined embankment.	CRA Fishery	Stantec: Blacknose Dace, and salmonid observed MNRF (2017; 2018d): Mudminnows, Bluntnose Minnow, Brook Stickleback, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Northern Redbelly Dace, Rainbow Trout, White Sucker	Cobble, gravel, boulder	Riparian Vegetation: cedars Instream Vegetation: none	None	Yes (coldwater thermal regime) Watercress upstream and downstream.	July 1 to Sept 30 (MNRF 2018d)
Unnamed Tributary 08	Permanent (MNRF 2017) Intermittent (based on Stantec's 2017 field investigations)	Cold (MNRF 2017; MNRF 2018d)	Unknown	Upstream: main source of flow appears to be from the east side of Vernonville Road, north of Rutherford Road and not as mapped from the east. Flat habitat 1.8 m wide and 1-2 cm deep with a pool at the catch basin. Downstream: pool at culvert 1.8 m wide and 0.45 m deep, transitions into a run that ranged between 0.4 m and 1.1 m wide and 9 cm to 15 cm deep. Flow continued as a flat through grassy vegetation beyond RoW. Upstream and Downstream: dry in the summer	CRA Fishery	Stantec: no catch MNRF (2017; 2018d): Mudminnows, Bluntnose Minnow, Brook Stickleback, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Northern Redbelly Dace, Rainbow Trout, White Sucker	Gravel, silt, cobble, sand and muck	Riparian Vegetation: grasses Instream Vegetation: grasses, sedges and cattails	None	No	July 1 to Sept 30 (MNRF 2018d)
Unnamed Tributary 09	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Unknown	Upstream: run-riffle-pool sequence over cobble, gravel and sand substrates, approximately 3 m wide and 0.25 m deep through cedar bush. Downstream: wide, deep pool, transitions to a run over sand and boulder, beyond pedestrian bridge, channel narrows and a riffle forms over cobble and gravel substrates and transitions into a run.	CRA Fishery	Stantec: White Sucker, Creek Chub, Brook Trout, Blacknose Dace MNRF (2017; 2018d): American Brook Lamprey, Lampreys, Bluntnose Minnow, Brook Stickleback, Brook Trout, Chum Salmon, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Golden Shiner, Johnny Darter/Tesselated Darter, Logperch, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Smelt, Rainbow Trout, Rock Bass, Sea Lamprey, Slimy Sculpin, Smallmouth Bass, White Sucker	Gravel, cobble, sand and boulder	Riparian Vegetation: cedar Instream Vegetation: none	Remove instream fencing to facilitate larger fish passage	Yes (coldwater thermal regime) Iron staining observed downstream, east side	July 1 to Sept 30 (MNRF 2018d)

Table 3-1: Summary of Fish and Fish Habitat Existing Conditions during Spring and Summer 2017; Highway 401 Cobourg to Colborne

Waterbody	Flow Regime	Thermal Regime	DFO Drain Classification*	Habitat Description	Fish Habitat Commercial Recreational or Aboriginal (CRA) Fishery	Fish Species Present	Substrate Type	Riparian and Instream Vegetation	Constraints and Opportunity	Important, Exceptional Fish Habitat	In-water Works Timing Window
Unnamed Tributary 10	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Unknown	Upstream: slightly meandering run over sand substrates through a grassy RoW. Scour at meander near culvert 0.35 m deep. Downstream: large, altered square pool at culvert, narrows to a flat at RoW fence and turns 90 degrees and flows west beyond fence.	CRA Fishery	Stantec: Creek Chub, Blacknose Dace MNRF (2017; 2018d): American Brook Lamprey, Lampreys, Bluntnose Minnow, Brook Stickleback, Brook Trout, Chum Salmon, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Golden Shiner, Johnny Darter/Tesselated Darter, Logperch, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Smelt, Rainbow Trout, Rock Bass, Sea Lamprey, Slimy Sculpin, Smallmouth Bass, White Sucker	Sand, gravel, silt and muck	Riparian Vegetation: none Instream Vegetation: watercress and cattails	Naturalize large, altered pool on downstream side Retain large ash tree on upstream side	Yes (coldwater thermal regime) Watercress at downstream RoW fence	July 1 to Sept 30 (MNRF 2018d)
Unnamed Tributary 11	Permanent (MNRF 2017) Intermittent (based on Stantec's 2017 field investigations)	Cold (MNRF 2017; MNRF 2018d)	Unknown	Upstream: trickle flow through muck and detritus substrates, no defined channel or bed, flow seeps out of ground. Seep 15 m east of culvert contributes flow, approximately 10 cm to 30 cm wide and 1 cm to 3 cm deep. Downstream: trickle flow through dense cattails, 30 cm wide and 6 cm deep. Turns 90 degrees at RoW fence to flow east and then south into the woods. Channelized within woods, approximately 50 cm wide and 50 cm deep. Upstream and Downstream: dry during the summer field investigation.	Supports CRA Fishery	Stantec: too little water to fish MNRF (2017; 2018d): American Brook Lamprey, Lampreys, Bluntnose Minnow, Brook Stickleback, Brook Trout, Chum Salmon, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Golden Shiner, Johnny Darter/Tesselated Darter, Logperch, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Smelt, Rainbow Trout, Rock Bass, Sea Lamprey, Slimy Sculpin, Smallmouth Bass, White Sucker	Silt, muck and detritus	Riparian Vegetation: mixed forest Instream Vegetation: cattails and horsetail	Increase riparian cover	Yes (coldwater thermal regime)	July 1 to Sept 30 (MNRF 2018d)

Table 3-1: Summary of Fish and Fish Habitat Existing Conditions during Spring and Summer 2017; Highway 401 Cobourg to Colborne

Waterbody	Flow Regime	Thermal Regime	DFO Drain Classification*	Habitat Description	Fish Habitat Commercial Recreational or Aboriginal (CRA) Fishery	Fish Species Present	Substrate Type	Riparian and Instream Vegetation	Constraints and Opportunity	Important, Exceptional Fish Habitat	In-water Works Timing Window
Unnamed Tributary 12	Permanent (MNRF 2017	Cold (MNRF 2017; MNRF 2018d)	Type D	Upstream: riffle-run sequence over coarse substrates, approximately 1.2 m to 2.6 m wide and 0.15 m deep. Drainage down a steep rip rap lined embankment has resulted in erosion. Downstream: scour/plunge pool at culvert, transitions into a run-riffle over coarse substrates. Seep located 5 m east of creek around old rusty culvert.	CRA Fishery	Stantec: Brook Trout, Fathead Minnow and Creek Chub MNRF (2017; 2018d): American Brook Lamprey, Lampreys, Bluntnose Minnow, Brook Stickleback, Brook Trout, Chum Salmon, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Golden Shiner, Johnny Darter/Tesselated Darter, Logperch, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Smelt, Rainbow Trout, Rock Bass, Sea Lamprey, Slimy Sculpin, Smallmouth Bass, White Sucker	Sand, gravel, cobble, boulder	Riparian Vegetation: cedars Instream Vegetation: grass	Stabilize embankment erosion	Yes (coldwater thermal regime)Iron staining at culvert, possible seepage within embankment	July 1 to Sept 30 (MNRF 2018d)
Unnamed Tributary 13	Permanent (MNRF 2017)	Cold (MNRF 2017; MNRF 2018d)	Type D	Upstream: riffle over cobble/gravel in concrete lined channel at culvert, flows into large catch basin. Upstream of fence, dense vegetation and cattail lined channel (no access). Dry during the summer field investigation. Downstream: concrete lined channel approximately 7 m long, drops into plunge pool 0.7 m deep, gravel and cobble lined. Boulder cascade approximately 35 m downstream, 1.2 m wide and 0.1 m deep, transitions into a run underlain with boulder/gravel/sand and then into a flat over gravel/sand, 0.8 m wide and 0.05 m wide.	CRA Fishery	Stantec: Blacknose Dace, Northern Redbelly Dace and Creek Chub MNRF (2017; 2018d): American Brook Lamprey, Lampreys, Bluntnose Minnow, Brook Stickleback, Brook Trout, Chum Salmon, Creek Chub, Eastern Blacknose Dace, Fathead Minnow, Golden Shiner, Johnny Darter/Tesselated Darter, Logperch, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Smelt, Rainbow Trout, Rock Bass, Sea Lamprey, Slimy Sculpin, Smallmouth Bass, White Sucker	Gravel, cobble, boulder and sand	Riparian Vegetation – deciduous trees Instream Vegetation: cattails and speedwell	Address barrier to fish movement (concrete apron on culvert, 0.6 m high)	Yes (coldwater thermal regime)	July 1 to Sept 30 (MNRF 2018d)

*MNRF 2018c
Type D - Permanent, coldwater, sensitive species present
Type E - Permanent, warmwater, sensitive species present

Table 3-2: Summary of *in situ* Water Quality Parameters Sampled during Spring and Summer 2017; GWP 4060-11-00 and GWP 4059-17-00

Watercourse Name	Flow Regime	Season*	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	pH
Unnamed Tributary 0A / Midtown Creek East	Intermittent (based on Stantec's Field Investigation)	Spring	17.1	8.10	461	7.27
		Summer	dry	dry	dry	dry
Unnamed Tributary 0B / Brook Creek West	Permanent (based on Stantec's Field Investigation)	Spring	15.7	11.99	448	7.74
		Summer	17.7	7.16	586	8.28
Unnamed Tributary 0C / Brook Creek East	Permanent (based on Stantec's Field Investigation)	Spring	no data**	no data	no data	no data
		Summer	17.1	7.26	693	8.10
Unnamed Tributary 1	Permanent (MNRF 2017)	Spring	9.5	11.52	345	8.21
		Summer	12.6	9.58	520	8.32
Unnamed Tributary 2	Permanent (MNRF 2017)	Spring	9.1	11.42	364	8.21
		Summer	12.7	9.08	493	8.19
Unnamed Tributary 3	Permanent (MNRF 2017)	Spring	10.9	11.30	508	8.08
		Summer	13.0	8.12	769	8.08
Unnamed Tributary 4	Permanent (MNRF 2017)	Spring	10.8	11.56	344	8.35
		Summer	13.8	7.99	496	8.29
Unnamed Tributary 6	Permanent (MNRF 2017)	Spring	11.6	10.61	381	8.19
		Summer	12.3	9.67	530	8.15
Shelter Valley Creek	Permanent (MNRF 2017)	Spring	13.3	10.86	361	8.22
		Summer	15.8	11.27	483	8.39

Table 3-2: Summary of *in situ* Water Quality Parameters Sampled during Spring and Summer 2017; GWP 4060-11-00 and GWP 4059-17-00

Watercourse Name	Flow Regime	Season*	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	pH
Unnamed Tributary 7	Permanent (MNRF 2017)	Spring	13.4	10.63	405	7.52
		Summer	17.5	7.01	499	8.11
Unnamed Tributary 8	Permanent (MNRF 2017) Intermittent (based on Stantec's 2017 field investigations)	Spring	18.0	7.87	410	8.01
		Summer	dry	dry	dry	dry
Unnamed Tributary 9	Permanent (MNRF 2017)	Spring	12.3	13.03	329	8.11
		Summer	17.1	6.94	425	8.12
Unnamed Tributary 10	Permanent (MNRF 2017)	Spring	11.4	13.30	304	8.16
		Summer	18.1	6.70	440	8.28
Unnamed Tributary 11	Permanent (MNRF 2017) Intermittent (based on Stantec's 2017 field investigations)	Spring	11.6	14.17	552	8.04
		Summer	dry	dry	dry	dry
Unnamed Tributary 12	Permanent (MNRF 2017)	Spring	13.5	12.84	327	8.22
		Summer	15.7	7.87	561	8.49
Unnamed Tributary 13	Permanent (MNRF 2017)	Spring	16.9	11.34	1,016	7.97
		Summer	14.9	7.43	1,074	8.05

* Spring survey June 13 to 16, 2017 and summer survey September 18 to 21, 2017
** Crossing was added to the Study Area after the spring survey

4.0 CONSTRAINTS AND OPPORTUNITIES

4.1 FISH AND FISH HABITAT

Sixteen of the seventeen water crossings were identified as watercourses that provide fish habitat. Species lists from background data sources and Stantec's field surveys indicate that the fish communities are comprised primarily of Brook Trout, Rainbow Trout and several small-bodied fish species. Among the sixteen sites that provide fish habitat, thirteen have a permanent flow regime and three have an intermittent flow regime.

Opportunities for habitat enhancement in the Study Areas include stabilizing eroding banks and removing barriers or impediments to fish passage, such as a cascade (Unnamed Tributary 0A), perched culvert (Unnamed Tributary 03, Unnamed Tributary 06, Unnamed Tributary 13), and a grade control structure (Unnamed Tributary 04).

4.2 AQUATIC SPECIES AT RISK

One species at risk, American Eel, has been recorded in Shelter Valley Creek (MNRF 2017; MNRF 2018b; MNRF 2018d; MNRF 2018e). American Eel is Endangered and protected by the ESA, 2007. If highway improvements are required at the Shelter Valley Creek crossing, design and construction will need to consider American Eel and its habitat.

As part of the provincially legislated recovery process, the MNRF released the *Recovery Strategy for American Eel in Ontario* (MacGregor et al. 2013). The Recovery Strategy states that, in Ontario, American Eel is at the northern extreme of its range. The Ontario population represents a large (and therefore important) portion of the spawning biomass of the global population (MacGregor et al. 2013).

The American Eel population has been in decline for the last century, which is attributed to the following reasons (MacGregor et al. 2013):

- Barriers preventing upstream migration to habitat
- Hydroelectric turbines
- Habitat destruction and alteration, contaminants
- Commercial harvesting outside Ontario

The Recovery Strategy outlines the importance of barrier removal for the recovery of the American Eel population (MacGregor et al. 2013).

In-stream vegetation and the interstitial spaces formed by rock piles and woody debris provide cover for eels during the day. The Recovery Strategy recommends protecting these areas as habitat (MacGregor et al. 2013). No in-stream vegetation was observed within the surveyed reach of the Shelter Valley Creek arched culvert. However, there were numerous large boulders, some overhanging vegetation and a fallen cedar tree that could provide minimal cover for eels. Once information is available regarding the nature and extent of work required at Shelter Valley Creek, the MNRF should be consulted to determine the potential need for a permit under the ESA, 2007.

5.0 SUMMARY

The MTO has retained Stantec to undertake a Planning, Preliminary Design, and Class EA Study on Highway 401 for the replacement and rehabilitation of structures, interchange modifications, future widening of the highway, and commuter parking lot expansions, from 2 km east of Nagle Road to Percy Street (approximately 18 km) (GWP 4060-11-00). The MTO and the Town of Cobourg have also retained Stantec to undertake a Planning, Preliminary Design, and Class EA Study on Highway 401 for a new interchange near Nagle Road in the Town of Cobourg and the Township of Hamilton. This study is being completed concurrently with the Highway 401 Planning Study from Cobourg to Colborne. The Nagle Road interchange Study Area is also covered in this report (GWP 4059-17-00).

This *Fish and Fish Habitat Existing Conditions Report* provides supporting documentation for the project and describes fish communities and fish habitat in the Study Areas.

Seventeen potential watercourse crossings were investigated within the Study Areas; sixteen of these crossings were identified as watercourses that provide fish habitat. Eight of these watercourses are Type D Drains (permanent coldwater, sensitive species present), one is a Type E Drain (permanent warmwater, sensitive species present) and five do not have an assigned drain classification (MNRF 2018a). Species lists from background data sources and Stantec's field surveys indicate that the fish communities are comprised primarily of Brook Trout, Rainbow Trout and numerous small-bodied fish species.

One species at risk, American Eel, has been recorded in Shelter Valley Creek (MNRF 2017; MNRF 2018b; MNRF 2018d; MNRF 2018e). American Eel is Endangered and protected by the ESA, 2007. If highway improvements are required at the Shelter Valley Creek crossing, design and construction will need to consider American Eel and its habitat. Once information is available regarding the nature and extent of work required at Shelter Valley Creek, the MNRF should be consulted to determine the potential need for a permit under the ESA, 2007.

The information provided in this *Fish and Fish Habitat Existing Conditions Report* will be used in conjunction with information from other disciplines and with information provided by local stakeholders to aid in the selection of a Recommended Plan.

6.0 REFERENCES

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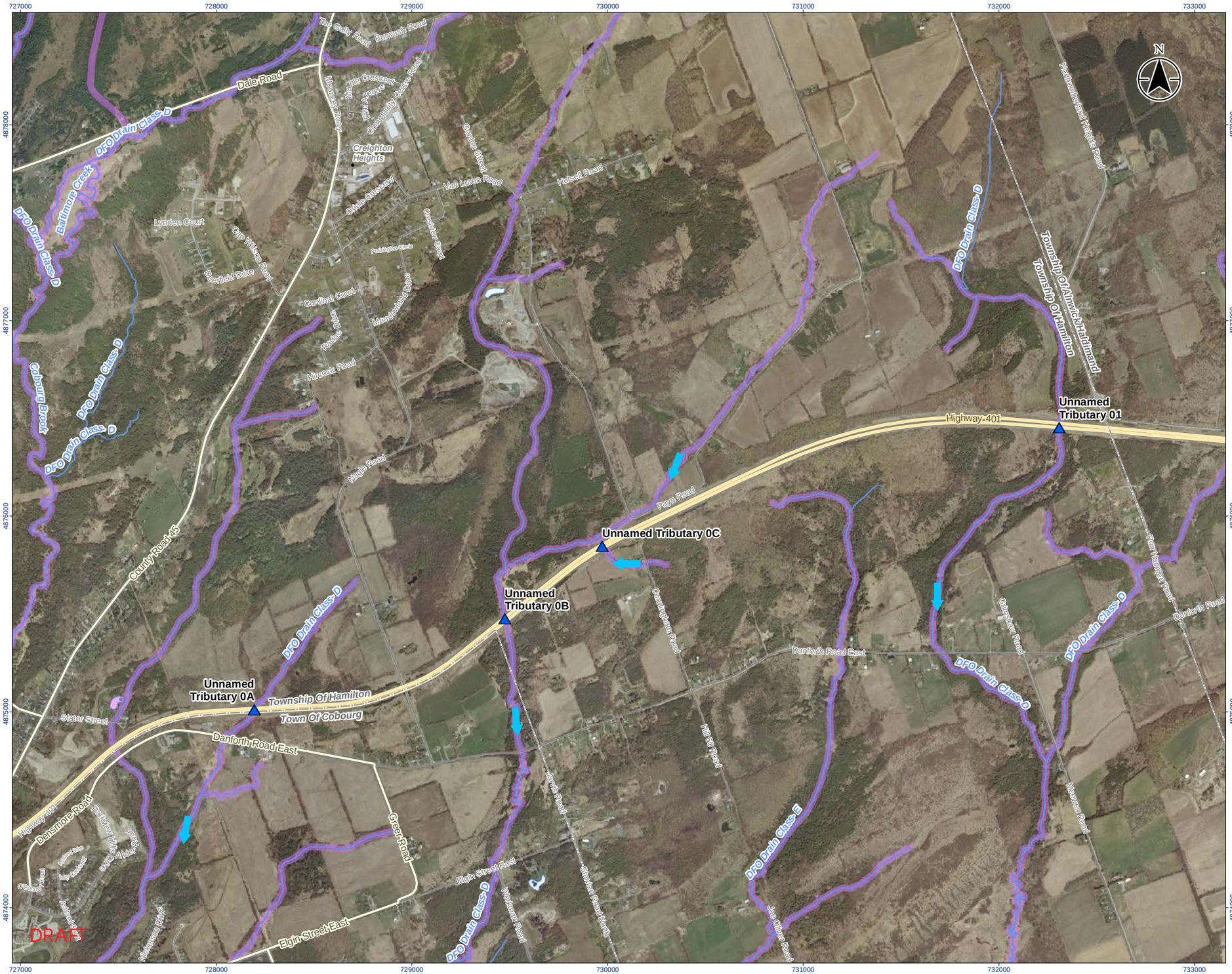
APPENDIX A: FIGURE 2



Stantec

Legend

- Flow Direction
- Watercourse Crossing Location
- Highway
- Major Road
- Minor Road
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Thermal Regime, Cold
- Conservation Area Administrative Boundary
- Municipal Boundary, Lower Tier

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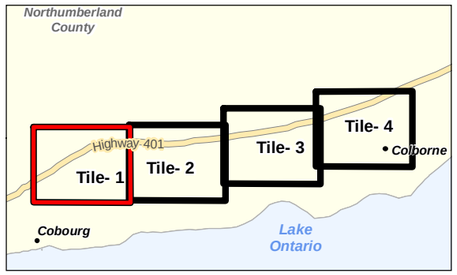
Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2016.
3. Orthoimagery © First Base Solutions, 2016. Imagery Date, 2008.



Project Location
Northumberland County

165001057 REVA
Prepared by DH on 2018-02-22
Technical Review by PW on 2018-02-08
Independent Review by ABC on yyyy-mm-dd

Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
2- 1

Title
Fish and Fish Habitat

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Stantec

Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location Northumberland County	165001057 REVA Prepared by DH on 2018-02-22 Technical Review by PW on 2018-02-08 Independent Review by ABC on yyyy-mm-dd

Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
2- 2

Title
Fish and Fish Habitat

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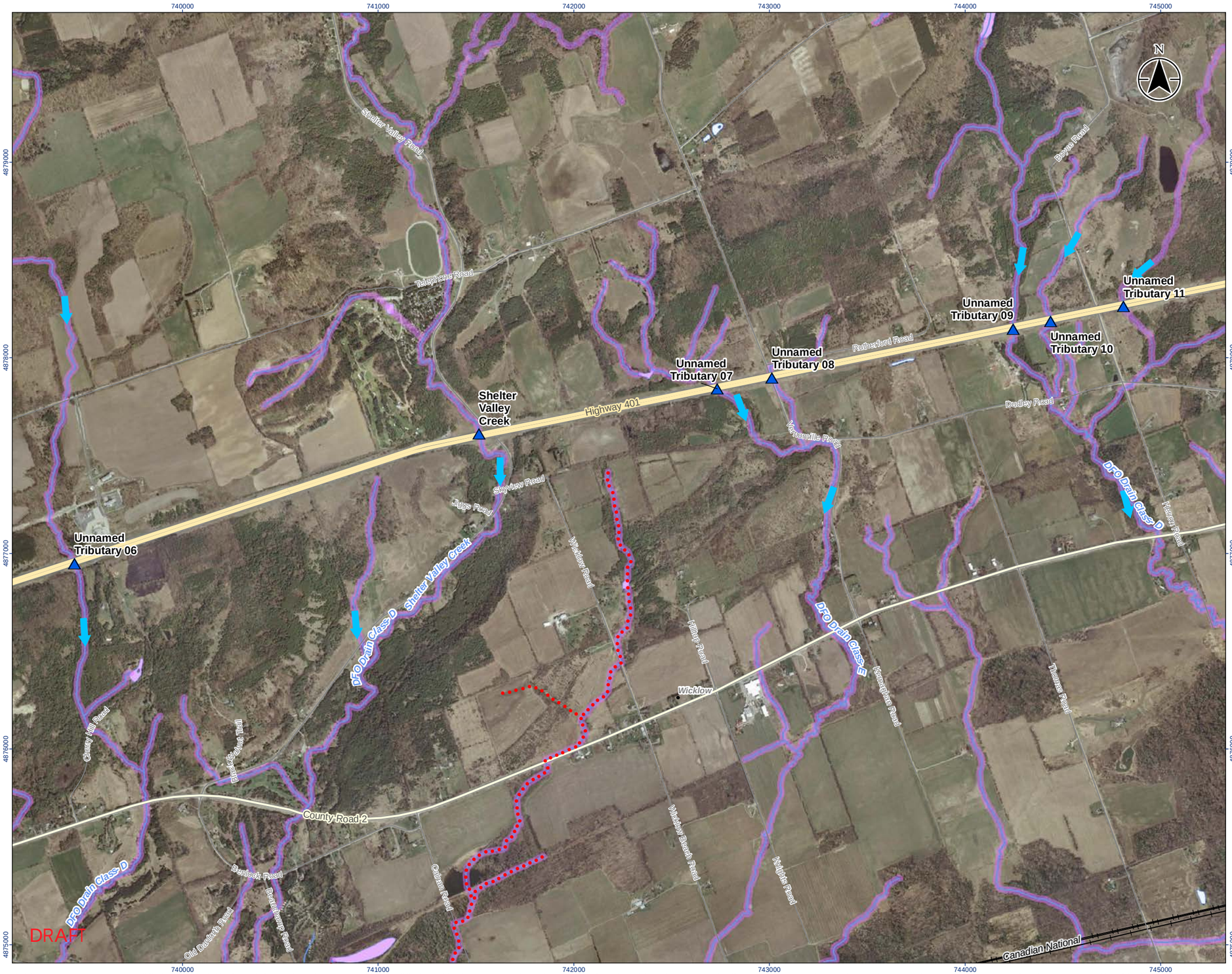

Legend

- Flow Direction
- Watercourse Crossing Location
- DFO Species At Risk (Fish)
- Highway
- Major Road
- Minor Road
- Railway
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Thermal Regime, Cold
- Conservation Area Administrative Boundary
- Municipal Boundary, Lower Tier

0 1 km

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Notes

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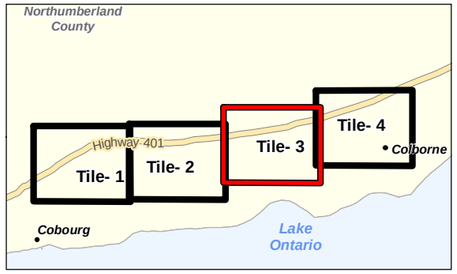

Project Location
Northumberland County

165001057 REVA
Prepared by DH on 2018-02-22
Technical Review by PW on 2018-02-08
Independent Review by ABC on yyyy-mm-dd

Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
2- 3

Title
Fish and Fish Habitat

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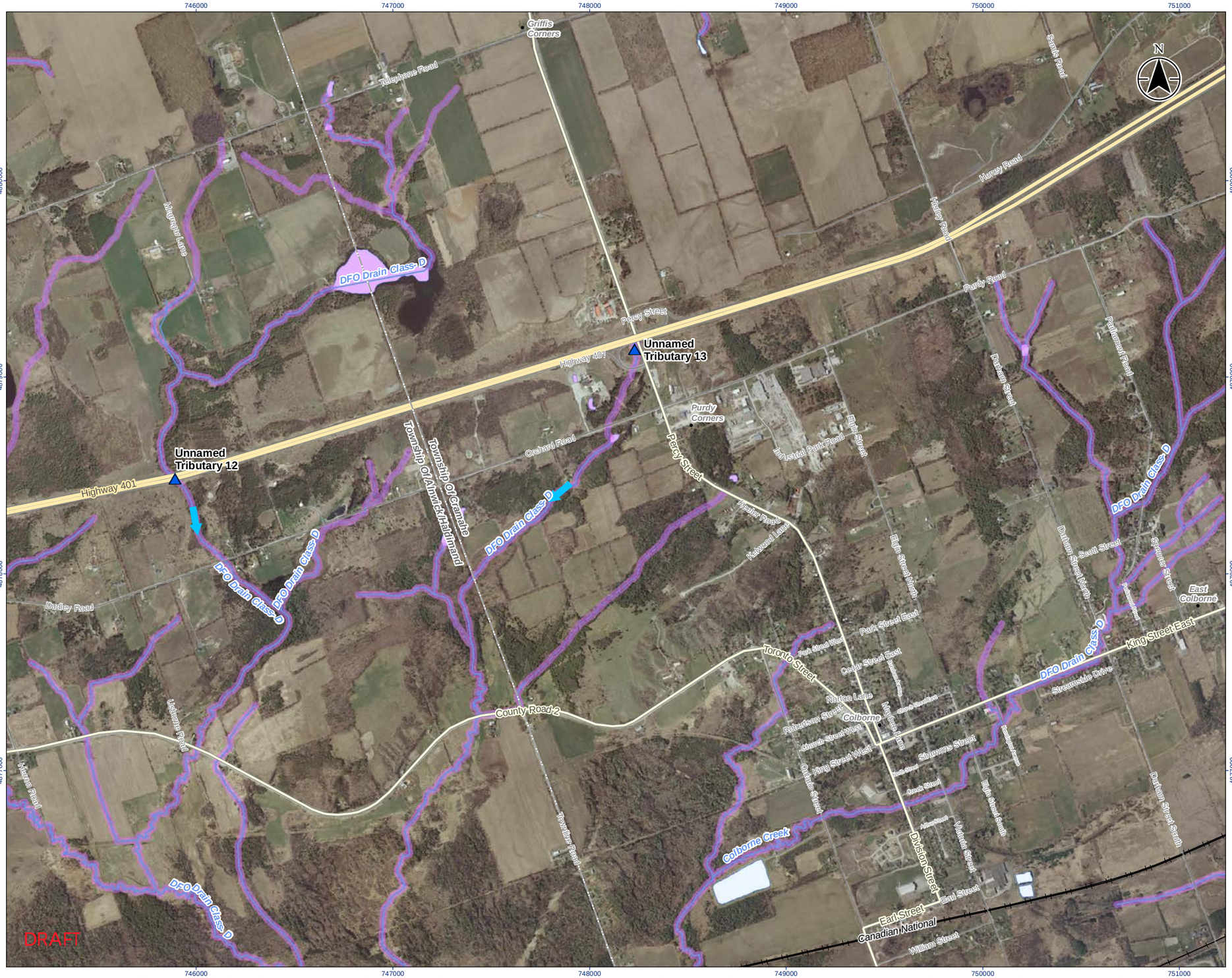

Stantec

Legend

- Flow Direction
- Watercourse Crossing Location
- Highway
- Major Road
- Minor Road
- Railway
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Thermal Regime, Cold
- Conservation Area Administrative Boundary
- Municipal Boundary, Lower Tier

0 1 km

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Notes

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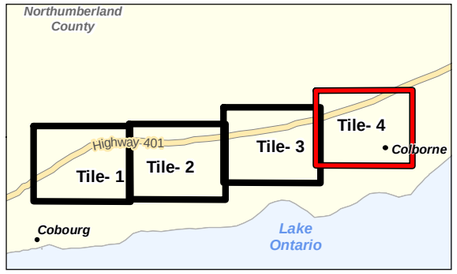

Project Location
Northumberland County

165001057 REVA
Prepared by DH on 2018-02-22
Technical Review by PW on 2018-02-08
Independent Review by ABC on yyyy-mm-dd

Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 WIDENING FROM COBOURG TO COLBORNE

Figure No.
2- 4

Title
Fish and Fish Habitat

V:\01609\active_Other_PCI_Active\650 - Hamilton\650l0057\drawing\MXD\Aquatic\Report\Figures\165001057_Fig_2_Fish_and_Fish_Habitat_20180222.mxd Revised: 2018-02-22 By: dharvey

APPENDIX B: AGENCY CORRESPONDENCE

Stantec

From:	Easterling, Katie
To:	"Formsma, Julie (MNRF)"
Cc:	Nevena Gazibara (Nevena.Gazibara@stantec.com); Kathleen Todd (kathleen.todd@stantec.com)
Subject:	RE: MTO Widening of Highway 401 for approximately 18 km between Cobourg and Colbourne - Application for a Licence to Collect Fish
Date:	Monday, May 29, 2017 10:49:00 AM
Attachments:	MNRF Peterborough Fish Application MTO Hwy 401 Cobourg to Colborne.pdf

Hello Julie,

I just wanted to follow up with you regarding the status of our licence to collect fish for MTO as our spring field work is schedule to start Monday next week (June 5). Any update you can provide would be much appreciated.

Thanks,
Katie

Katie Easterling, B.Sc (Hon)
Aquatic Ecologist
Stantec
100-300 Hagey Boulevard, Waterloo ON N2L 0A4
Phone: (519) 575-4111
Cell: (519) 859-8391
Fax: (519) 579-4239
Katie.Easterling@stantec.com

From: Easterling, Katie
Sent: Thursday, May 04, 2017 10:39 AM
To: 'Formsma, Julie (MNRF)' <julie.formsma@ontario.ca>
Cc: Nevena Gazibara (Nevena.Gazibara@stantec.com) <Nevena.Gazibara@stantec.com>; Kathleen Todd (kathleen.todd@stantec.com) <kathleen.todd@stantec.com>
Subject: MTO Widening of Highway 401 for approximately 18 km between Cobourg and Colbourne - Application for a Licence to Collect Fish

Hello Julie,

The Ontario Ministry of Transportation has retained Stantec Consulting to complete environmental investigations and collect existing conditions data for a future Preliminary Design and Environmental Assessment for the widening of Highway 401 for approximately 18 km between Cobourg and Colbourne. The future project includes the widening of Highway 401 to six lanes and interchange improvements, modifications and ultimate configurations.

Attached is an application for a LCFSP and accompanying VHS questionnaire for the above-referenced project.

Fish will be collected using standard minnow traps, seine net and/or an electro-fisher and dip nets. Mesh size on collection gear will be ¼ inch or smaller to ensure the capture of fish of all sizes, including small-bodied fish. All electro-fishing will be overseen by a certified Class 2 electrofishing crew leader. Field personnel have completed the Royal Ontario Museum Fish Identification Workshop and are experienced in the identification of freshwater fishes of Canada. All fish will be identified on site and released live into the reaches from which they were collected except for specimens which may need to be retained for species verification.

Best Management practices will be employed to prevent the spread of invasive species and Viral Hemorrhagic Septicemia (VHS) following the guidance provided in the Ministry of Natural Resources Fisheries Section VHS Technical Bulletin (see attached VHS questionnaire).

One spring sampling session will be conducted between **May 15 and June 21, 2017** and one summer sampling session will be conducted between **June 21 and September 30, 2017**. The attached Application to Collect Fish for Scientific Purposes should contain all the details you require. If you have any questions, please let me know.

Cheers,
Katie

Katie Easterling, B.Sc (Hon)
Aquatic Ecologist
Stantec
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Cell: (519) 859-8391
Fax: (519) 579-4239
Katie.Easterling@stantec.com

Naylor, Carol

From: Formsma, Julie (MNRF) <julie.formsma@ontario.ca>
Sent: Thursday, June 01, 2017 7:11 PM
To: Easterling, Katie
Cc: Gazibara, Nevena; Todd, Kathleen
Subject: RE: MTO Widening of Highway 401 for approximately 18 km between Cobourg and Colbourne - Application for a Licence to Collect Fish
Attachments: 2017 Easterling, K Stantec Hwy 401 Hamilton to Cramahe LCFSP 1086878 and conditions for signatures.pdf; Watercourse ID and Fish Community Information from MNRF.docx

HI Katie,
Here is the licence to collect fish for scientific purposes for the culvert locations along the 401 from Hamilton to Cramahe for the preliminary fish community assessments. Most are cold water creeks.
I've included the fish community information we have on file along with the timing windows for in water work. Please ensure you follow conditions and look for spawning fish prior to sampling for this assessment.

Please review, print and sign the licence and conditions and return a copy to me for our files.

A mandatory report will be due to this office by the end of January 2018 at the latest. I will forward the form in a separate email to be returned to me via secure file transfer since the macros prevent transfer via regular email.

Please carry the licence and conditions on your person while in the field, please have any named assistant also carry it while acting on your behalf in the field.

If you have any questions, please let me know.

Julie

Julie Formsma
Fish & Wildlife Technical Specialist
Peterborough District MNRF 300 Water St, 1 South, Peterborough, ON K9J 8M5
Phone: 705-755-3296 Fax: 705-755-3125

From: Easterling, Katie [mailto:Katie.Easterling@stantec.com]
Sent: May 29, 2017 10:50 AM
To: Formsma, Julie (MNRF)
Cc: Gazibara, Nevena; Todd, Kathleen
Subject: RE: MTO Widening of Highway 401 for approximately 18 km between Cobourg and Colbourne - Application for a Licence to Collect Fish

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Cell: (519) 859-8391
Fax: (519) 579-4239
Katie.Easterling@stantec.com

From: Easterling, Katie
Sent: Thursday, May 04, 2017 10:39 AM
To: 'Formsma, Julie (MNRF)' <julie.formsma@ontario.ca>
Cc: Nevena Gazibara (Nevena.Gazibara@stantec.com) <Nevena.Gazibara@stantec.com>; Kathleen Todd (kathleen.todd@stantec.com) <kathleen.todd@stantec.com>
Subject: MTO Widening of Highway 401 for approximately 18 km between Cobourg and Colbourne - Application for a Licence to Collect Fish

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Cheers,
Katie

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Phone: (519) 575-4111
Cell: (519) 859-8391
Fax: (519) 579-4239
Katie.Easterling@stantec.com

Review of Fish Community Information from MNRF Peterborough District

Watercourse ID	Easting	Northing	thermal	species	timing window
Shelter Valley Creek	260560	4877535	cold	American eel,Atlantic salmon,Chinook salmon,black bullhead,bluegill,bluntnose minnow,brook stickleback,brook trout,brown bullhead,brown trout,central mudminnow,coho salmon,common shiner,creek chub,eastern blacknose dace,emerald shiner,fantail darter,fathead minnow,finescale dace,golden shiner,johnny darter/tesselated darter,largemouth bass,logperch,longnose dace,mottled sculpin,northern brook lamprey,northern hog sucker,northern redbelly dace,pumpkinseed,rainbow trout,rock bass,sea lamprey,smallmouth bass,spottail shiner,threespine stickleback,white sucker,yellow perch	Sept 15-May 31
Unnamed Tributary 01	732308	4876453	cold	brook trout,creek chub,eastern blacknose dace,longnose dace, rainbow trout,white sucker	Oct 1-May 31
Unnamed Tributary 02	733246	4876374	cold	brook trout,creek chub,eastern blacknose dace,longnose dace, rainbow trout,white sucker	Oct 1-May 31
Unnamed Tributary 03	735157	4875780	cold	American brook lamprey,Atlantic salmon,black crappie, bluntnose minnow,brook trout,brown bullhead,brown trout, central mudminnow,coho salmon,common shiner,creek chub, eastern blacknose dace,emerald shiner,fantail darter, fathead minnow,johnny darter/tesselated darter,longnose dace,northern brook lamprey,northern hog sucker, northern redbelly dace,pumpkinseed,rainbow darter, rainbow trout,rock bass,sea lamprey,smallmouth bass, stonecat,white sucker	Sept 15-May 31
Unnamed Tributary 04	736569	4876090	cold	American brook lamprey,Atlantic salmon,black crappie,bluntnose minnow,brook trout,brown bullhead,brown trout,central mudminnow,coho salmon,common shiner,creek chub,eastern blacknose dace,emerald shiner,fantail darter,fathead minnow,johnny darter/tesselated darter,longnose dace,northern brook lamprey,northern hog sucker,northern redbelly dace,pumpkinseed,rainbow darter,rainbow trout,rock bass,sea lamprey,smallmouth bass,stonecat,white sucker	Sept 15-May 31

Review of Fish Community Information from MNRF Peterborough District

Watercourse ID	Easting	Northing	thermal	species	timing window
Unnamed Tributary 05	737656	4876304	cold	American brook lamprey,Atlantic salmon,black crappie,bluntnose minnow,brook trout,brown bullhead,brown trout,central mudminnow,coho salmon,common shiner,creek chub,eastern blacknose dace,emerald shiner,fantail darter,fathead minnow,johnny darter/tesselated darter,longnose dace,northern brook lamprey,northern hog sucker,northern redbelly dace,pumpkinseed,rainbow darter,rainbow trout,rock bass,sea lamprey,smallmouth bass,stonecat,white sucker	Sept 15-May 31
Unnamed Tributary 06	739449	4876949	cold	Mudminnows,Sticklebacks,brook stickleback,creek chub,eastern blacknose dace,fathead minnow,johnny darter/tesselated darter,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow trout,threespine stickleback,white sucker	April 1 - June 15
Unnamed Tributary 07	261790	4877676	cold	Mudminnows,bluntnose minnow,brook stickleback,creek chub,eastern blacknose dace,fathead minnow,northern redbelly dace,rainbow trout,white sucker	April 1 - June 15
Unnamed Tributary 08	262074	4877712	cold	Mudminnows,bluntnose minnow,brook stickleback,creek chub,eastern blacknose dace,fathead minnow,northern redbelly dace,rainbow trout,white sucker	April 1 - June 15
Unnamed Tributary 09	263320	4877873	cold	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Oct 1-May 31
Unnamed Tributary 10	263515	4877898	cold	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Oct 1-May 31

Review of Fish Community Information from MNRF Peterborough District

Watercourse ID	Easting	Northing	thermal	species	timing window
Unnamed Tributary 11	263892	4877946	cold	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Oct 1-May 31
Unnamed Tributary 12	264988	4878088	cold	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Oct 1-May 31
Unnamed Tributary 13	267367	4878575	cold	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Oct 1-May 31

From:	Penyk, Henry (MNRF)
To:	Gazibara, Nevena
Subject:	Re: Preliminary design and Class EA Hwy 401 from Cobourg to Colborne (18-HAMI-NOR-EAE-2677 and PB2018-0448)
Date:	Wednesday, June 06, 2018 2:35:07 PM
Attachments:	BW_Cranberry (Little) Lake Wetland.pdf CranberryLakeWetlandSummary.pdf FishScreeningMapCH2018-06-06.pdf FishScreeningTableCH2018-06-06.xlsx

---

Good Afternoon Nevena,

MNRF Peterborough District has received your email (dated 04-26-2018) regarding the MTO Environmental Assessment for Highway 401 rehabilitation and future widening with respect to the project area located in the from 2km east of Nagle Road to Percy street (approximately 18 km). We provide the following general information and technical advice for your consideration:

General: MNRF Data and Information

MNRF's natural heritage and natural resources GIS data layers (including wetlands, ANSIs, and species at risk observations) can be obtained through the Ministry's Land Information Ontario (LIO) website. You may also view natural heritage information online (e.g. Provincially Significant Wetlands, ANSIs, woodlands, species at risk 1 km screening squares) using the Natural Heritage Make a Map tool. To determine which species are protected under the Endangered Species Act, please refer to the Species at Risk in Ontario List.

We recommend that you use the above-noted sources of information during review of your project proposal.

Wetlands

The subject property is adjacent to Provincially Significant Wetlands, Cranberry (little) Lake PSW adjacent to 401 at County Road 23 exit (North Side of 401). We recommend contacting your local Conservation Authority for more information on approvals that may be required.
In areas without Conservation Authority (CA) coverage, the delegated CA responsibilities fall to the municipality.

Fisheries

All crossings involve cold water streams, both spring and fall spawners, apply both in water work timing windows (Oct.1 to June 30th).

Attached to the email is the relevant map and table for Fisheries information.

Please contact Department of Fisheries and Oceans and/or the local Conservation Authority for any approvals that may be required and/or sediment/erosion control measures that may be required to be installed prior/during/after construction.

Species at Risk

A review of our best available information indicates that there are observations of the following species (endangered/threatened/special concern) in the immediate area of the

site (1 km radius):

1. American Eel (END)
2. Bank Swallow (THR)
3. Barn Swallow (THR)
4. Eastern Meadowlark (THR)
5. Peregrine Falcon (SC)
6. Silver Lamprey (Great Lakes – Upper St. Lawrence Populations) (SC)
7. Snapping Turtle (SC)
8. Wood Thrush (SC)

Also, there are observations of the following species (endangered/threatened/special concern) in the general area (5 km) of the proposed activities:

1. Blanding's Turtle (THR)
2. Bobolink (THR)
3. Butternut (END)
4. Canada warbler (SC)
5. Cerulean Warbler (THR)
6. Chimney Swift (THR)
7. Cucumber Tree (END)
8. Eastern Hog-nosed Snake (THR)
9. Eastern Prairie Fringed Orchid (END)
10. Eastern Ribbonsnake (SC)
11. Eastern Wood-pewee (SC)
12. Lake Sturgeon (Great Lakes – Upper St. Lawrence River Population) (THR)
13. Little Brown Myotis (END)
14. Loggerhead Shrike (END)
15. Northern Brook Lamprey (SC)
16. Red-headed Woodpecker (SC)
17. Short-eared Owl (SC)

Although no other threatened or endangered species or their habitat have been documented in the area of the proposed projects, these features may be present and this list should not be considered complete.

Species listed as endangered or threatened on the Species at Risk in Ontario (SARO) list are protected under the Endangered Species Act, 2007 (ESA). Section 9(1) of the ESA prohibits a person from killing, harming, harassing, capturing or taking a member of a species listed as endangered, threatened or extirpated on the SARO list. Section 10(1) of the ESA prohibits the damage or destruction of habitat of a species listed as endangered or threatened on the SARO list.

Since comprehensive mapping for most species at risk is not available, a site assessment is recommended to identify the presence of any species at risk and/or their habitat on the subject lands, as a decision should not be made in the absence of such information. The focus of the site assessment can include a review of the information about known occurrences provided by MNRF above along with other information sources such as species distributions and habitat requirements as well as field visits using MNRF approved protocols during the appropriate seasons by a qualified professional.

Due to the species that are potentially present at this site, the following recommendations should help prevent adverse impacts:

Birds

Workers must be vigilant and check work areas for the presence of breeding birds and nests containing eggs and/or young. If breeding birds and/or nests are encountered, works should not continue in the location of the nest until after August 1 (or as soon as it has been determined that that the young have left the nest). Please note that the breeding bird season in the subject area extends from April 15 to July 31.

Specific Barn Swallow Information: Barn Swallow nests may be present under bridges and/or culverts. Therefore, the underside of these structures should be assessed for Barn Swallow nests before proceeding. If no nests are present, a contravention of the ESA is unlikely. However, if nests are present, construction should not begin until after August 15 of any year. If nests will be impacted during the nesting season or if the structure will no longer be suitable for nesting post-construction, ESA requirements will apply to the activity. A regulatory provision is available that allows eligible activities that impact to Barn Swallow to register and follow all the rules in regulation in place of applying for a permit under the ESA. See this website for more information on regulatory requirements for Barn Swallow.

Turtles and Snakes

Workers must be vigilant and check work areas for the presence of turtles. If turtles or snakes are encountered, whenever possible, work should be temporarily suspended until the animal is out of harm's way. Workers should report any turtle observations (including photographs and coordinates) to the Peterborough District Office immediately at 705-755-2001. **Please note that the turtle nesting season in the subject area extends from May 15th to September 30th.** Therefore, activities which may cause adverse impacts to a species or habitat (e.g. use of heavy equipment) should commence after September 30th.

If you are proposing to conduct SAR/habitat surveys, please contact us for appropriate survey protocols.

Butternut:

If a Butternut tree(s) is identified and is to be removed, trimmed or is in close proximity to the application of herbicides, a Butternut Health Assessment must be conducted by an individual trained and certified by MNRF as a Butternut Health Assessor (BHA) as per the Ontario Butternut Assessment Guidelines (Dec 2014). All Butternut Health Assessments must be submitted to the MNRF District office for a 30 day review period before proceeding. Depending on the results of the assessment, you may have different options for how to proceed. Please see our online factsheet for more information. Please note that the ideal time of year to properly identify Butternut is during the leaf on period (approximately June to August). Workers should report any Butternut observations (including photographs and coordinates) to the Peterborough District Office immediately upon discovery. For those Butternut that are not proposed for removal, a minimum protective buffer of a 25 metre radius from the stem of each Butternut is required to prevent root disturbance. A larger area up to 50 m is also considered protected habitat for the tree. Within the 25 metre buffer area, activities that would remove or significantly compact the roots and soil, and cause direct harm to the Butternut are not permitted. Within the 25-50 metre buffer area, activities that would significantly damage or destroy habitat e.g. by impacting the tree's ability to disperse seeds are also not permitted. Removal of other vegetation and careful logging practices within this radius are permitted.

Regulatory Provisions and Further Registration Options
The ESA provides regulatory provisions for certain eligible activities to proceed without an ESA permit. To be eligible, the proponent register with the MNRF and adhere to specific rules in regulation under the ESA. To assess your eligibility please see the links below:

- Information on the ESA regulatory provision
- ESA regulation (O. Reg. 242/08).

If an impact to a species at risk or its habitat cannot be avoided, a person(s) should contact MNRF to discuss options, including applying for an authorization under the ESA. In situations where an activity is not registered with or authorized by the MNRF, a person(s) must comply with the ESA by modifying proposed activities to avoid impacts to species at risk and habitat protected under the ESA.

It is highly recommended that landowners and on-site workers familiarize themselves with MNRF's Species at Risk website.

During on-site activities, should any species at risk or their habitat be potentially impacted, MNRF should be contacted immediately and operations should be modified to avoid any negative impacts to species at risk or their habitat until further discussions with MNRF can occur regarding opportunities for mitigation. If any species at risk are found, the MNRF Peterborough District Office should be contacted at **705-755-2001**. If possible, pictures of the species at risk and coordinates for the location where it was observed should be provided to MNRF.

Petroleum Wells & Oil, Gas and Salt Resource Act
There may be petroleum wells within the proposed project area. Please consult the Ontario Oil, Gas and Salt Resources Library website (www.ogsrlibrary.com) for the best known data on any wells recorded by MNRF. Please reference the 'Definitions and Terminology Guide' listed in the publications on the Library website in order to better understand the well information available. Any oil and gas wells in your project area are regulated by the *Oil, Gas and Salt Resource Act*, and the supporting regulations and operating standards. If any unanticipated wells are encountered during development of the project, or if the proponent has questions regarding petroleum operations, the proponent should contact the Petroleum Operations Section at 519-873-4634.

General Information Regarding MNRF approvals:

Fish and Wildlife Conservation Act
Please note that you may require a Scientific Collector's Permit from our office if you will be doing any fish or wildlife sampling, collection, salvage, or relocation within Peterborough District. For more information about Scientific Collector's Permits, please contact Julie Formsma, Fish and Wildlife Technical Specialist at 705-755-3296.

Other Approvals
It is the responsibility of the proponent to acquire all other information and necessary approvals from any other municipal, provincial or federal authority under other legislation. We recommend that you contact your local Conservation Authority, Department of Fisheries and Oceans, Ministry of the Environment and Climate Change, Ministry of Tourism, Culture and Sport, etc.

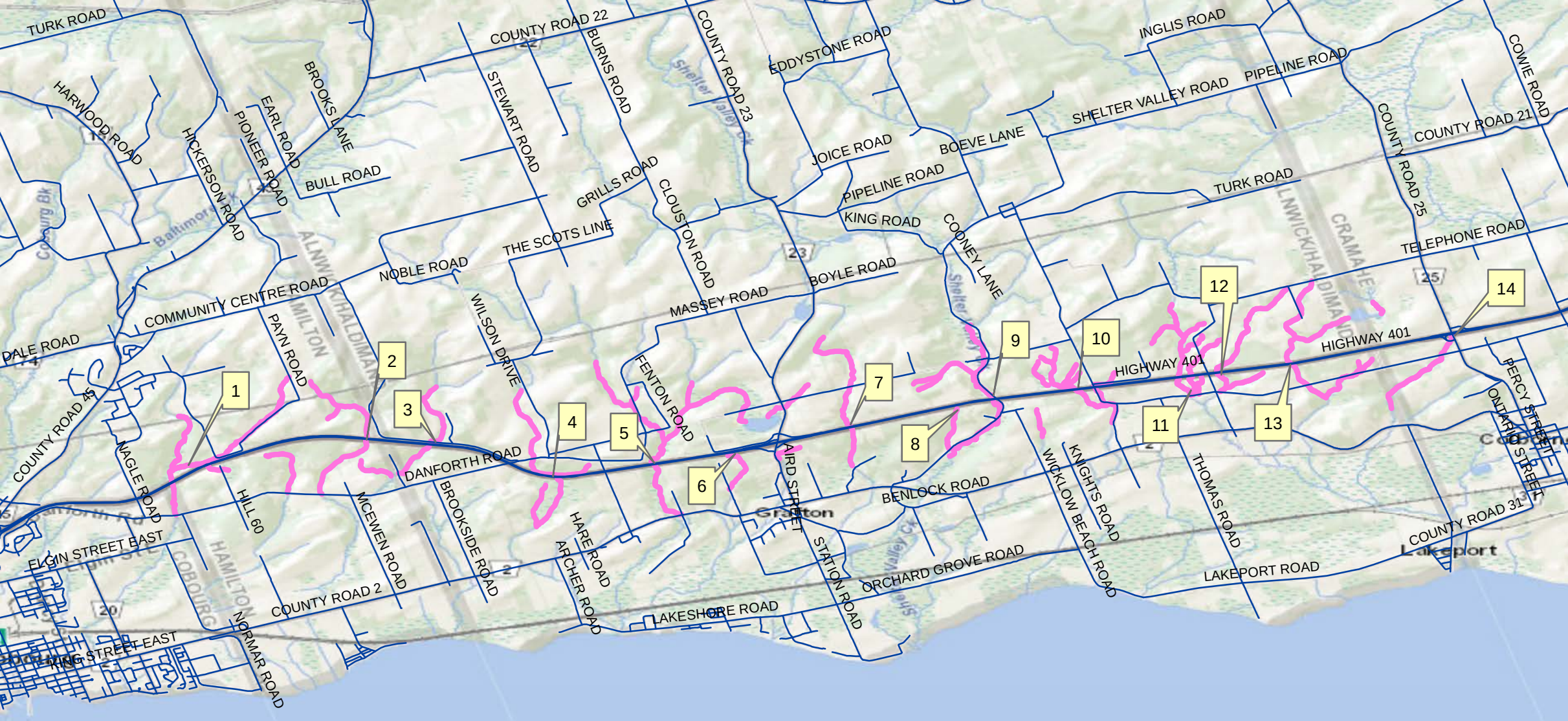
If you have any questions regarding the above comments, don't hesitate to contact me. Please reference file number **18-HAMI-NOR-EAE-2677 and PB2018-0448** for any future correspondence.

Sincerely,
Henry Penyk

Henry Penyk
Land Use Planning Assistant
Peterborough District, Ministry of Natural Resources and Forestry
300 Water St. Peterborough ON, K9J 3C7

Henry.penyk@ontario.ca

Please note: As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.


TURK ROAD
COUNTY ROAD 22
HARWOOD ROAD
HICKERSON ROAD
PIONEER ROAD
EARL ROAD
BROOKS LANE
BULL ROAD
STEWART ROAD
BURNS ROAD
COUNTY ROAD 23
EDDYSTONE ROAD
INGLIS ROAD
PIPELINE ROAD
SHELTER VALLEY ROAD
COWIE ROAD
COUNTY ROAD 21
COUNTY ROAD 25
JOICE ROAD
BOEVE LANE
GRILLS ROAD
CLOUSTON ROAD
PIPELINE ROAD
KING ROAD
COONEY LANE
TURK ROAD
TELEPHONE ROAD
THE SCOTS LINE
NOBLE ROAD
BOYLE ROAD
MASSEY ROAD
COMMUNITY CENTRE ROAD
DALE ROAD
PAYN ROAD
WILSON DRIVE
FENTON ROAD
HIGHWAY 401
COUNTY ROAD 45
NAGLE ROAD
DANFORTH ROAD
HILL 60
MCEWEN ROAD
BROOKSIDE ROAD
HARE ROAD
ARCHER ROAD
AIRD STREET
BENLOCK ROAD
WICKLOW BEACH ROAD
KNIGHTS ROAD
THOMAS ROAD
PERCY STREET
ONTARIO STREET
ELGIN STREET EAST
COUNTY ROAD 2
ORCHARD GROVE ROAD
STATION ROAD
LAKESHORE ROAD
LAKEPORT ROAD
COUNTY ROAD 31
KING STREET EAST
NORMAR ROAD
Grafton
Lakeport
1
2
3
4
5
6
7
8
9
10
11
12
13
14

Location (from Fish Screening Map)	Species	Thermal Regime	Timing Window (no in-water work)
1	brook stickleback,brook trout,common shiner,creek chub,eastern blacknose dace,fathead minnow,johnny darter/tesselated darter,longnose dace,mottled sculpin,northern redbelly dace,rainbow trout,white sucker	Cold	Oct. 1-June 30
2	brook trout,creek chub,eastern blacknose dace,longnose dace,rainbow trout,white sucker	Cold	Oct. 1-June 30
3	brook trout,creek chub,eastern blacknose dace,longnose dace,rainbow trout,white sucker	Cold	Oct. 1-June 30
4	American brook lamprey,Atlantic salmon,black crappie,bluntnose minnow,brook trout,brown bullhead,brown trout,central mudminnow,coho salmon,common shiner,creek chub,eastern blacknose dace,emerald shiner,fantail darter,fathead minnow,johnny darter/tesselated darter,longnose dace,northern brook lamprey,northern hog sucker,northern redbelly dace,pumpkinseed,rainbow darter,rainbow trout,rock bass,sea lamprey,smallmouth bass,stonecat,white sucker	Cold	Oct. 1-June 30
5	American brook lamprey,Atlantic salmon,black crappie,bluntnose minnow,brook trout,brown bullhead,brown trout,central mudminnow,coho salmon,common shiner,creek chub,eastern blacknose dace,emerald shiner,fantail darter,fathead minnow,johnny darter/tesselated darter,longnose dace,northern brook lamprey,northern hog sucker,northern redbelly dace,pumpkinseed,rainbow darter,rainbow trout,rock bass,sea lamprey,smallmouth bass,stonecat,white sucker	Cold	Oct. 1-June 30
6	American brook lamprey,Atlantic salmon,black crappie,bluntnose minnow,brook trout,brown bullhead,brown trout,central mudminnow,coho salmon,common shiner,creek chub,eastern blacknose dace,emerald shiner,fantail darter,fathead minnow,johnny darter/tesselated darter,longnose dace,northern brook lamprey,northern hog sucker,northern redbelly dace,pumpkinseed,rainbow darter,rainbow trout,rock bass,sea lamprey,smallmouth bass,stonecat,white sucker	Cold	Oct. 1-June 30
7	American brook lamprey,Lampreys,brook stickleback,brook trout,creek chub,eastern blacknose dace,fathead minnow,finescale dace,johnny darter/tesselated darter,northern redbelly dace,rainbow trout. Mudminnows,longnose dace,mottled sculpin, pumpkinseed,threespine stickleback,white sucker	Cold	Oct. 1-June 30
8	American eel,Atlantic salmon,Chinook salmon,black bullhead,bluegill,bluntnose minnow,brook stickleback,brook trout,brown bullhead,brown trout,central mudminnow,coho salmon,common shiner,creek chub,eastern blacknose dace,emerald shiner,fantail darter,fathead minnow,finescale dace,golden shiner,johnny darter/tesselated darter,largemouth bass,logperch,longnose dace,mottled sculpin,northern brook lamprey,northern hog sucker,northern redbelly dace,pumpkinseed,rainbow trout,rock bass,sea lamprey,smallmouth bass,spottail shiner,threespine stickleback,white sucker,yellow perch	Cold	Oct. 1-June 30
9	American eel,Atlantic salmon,Chinook salmon,black bullhead,bluegill,bluntnose minnow,brook stickleback,brook trout,brown bullhead,brown trout,central mudminnow,coho salmon,common shiner,creek chub,eastern blacknose dace,emerald shiner,fantail darter,fathead minnow,finescale dace,golden shiner,johnny darter/tesselated darter,largemouth bass,logperch,longnose dace,mottled sculpin,northern brook lamprey,northern hog sucker,northern redbelly dace,pumpkinseed,rainbow trout,rock bass,sea lamprey,smallmouth bass,spottail shiner,threespine stickleback,white sucker,yellow perch	Cold	Oct. 1-June 30
10	Mudminnows,bluntnose minnow,brook stickleback,creek chub,eastern blacknose dace,fathead minnow,northern redbelly dace,rainbow trout,white sucker	Cold	Oct. 1-June 30
11	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Cold	Oct. 1-June 30
12	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Cold	Oct. 1-June 30
13	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Cold	Oct. 1-June 30
14	American brook lamprey,Lampreys,bluntnose minnow,brook stickleback,brook trout,chum salmon,creek chub,eastern blacknose dace,fathead minnow,golden shiner,johnny darter/tesselated darter,logperch,longnose dace,mottled sculpin,northern redbelly dace,pumpkinseed,rainbow smelt,rainbow trout,rock bass,sea lamprey,slimy sculpin,smallmouth bass,white sucker	Cold	Oct. 1-June 30

From:	Prell, Phil (MNRF)
To:	Gazibara, Nevena
Subject:	Revised Species at Risk list for the Preliminary Design and Class Environmental Assessment for Highway 401 Planning Study for Cobourg to Colborne
Date:	Tuesday, September 04, 2018 2:53:08 PM

Dear Nevena,

Below is the revised list of species at risk for the hwy 401 project. Not much as changed (see below).

Revised list of Species at Risk (this changed in early August):

Species at Risk

A review of our best available information indicates that there are observations of the following species (endangered/threatened/special concern) in the immediate area of the site (1 km radius):

1. American Eel (END)
2. Bank Swallow (THR)
3. Barn Swallow (THR)
4. Eastern Meadowlark (THR)
5. Peregrine Falcon (SC)
6. Silver Lamprey (Great Lakes – Upper St. Lawrence Populations) (SC)
7. Snapping Turtle (SC)
8. Wood Thrush (SC)

Also, there are observations of the following species (endangered/threatened/special concern) in the general area (5 km) of the proposed activities:

1. Blanding's Turtle (THR)
2. Bobolink (THR)
3. Butternut (END)
4. Canada warbler (SC)
5. Cerulean Warbler (THR)
6. Chimney Swift (THR)
7. Cucumber Tree (END)
8. Eastern Hog-nosed Snake (THR)
9. Eastern Prairie Fringed Orchid (END)
10. Eastern Ribbonsnake (SC)
11. Eastern Wood-pewee (SC)
12. Lake Sturgeon (Great Lakes – Upper St. Lawrence River Population) (THR) →

changed to (E)

13. Little Brown Myotis (END)
14. Loggerhead Shrike (END)
15. Northern Brook Lamprey (SC)
16. Red-headed Woodpecker (SC)
17. Short-eared Owl (SC)

Although no other threatened or endangered species or their habitat have been documented in the area of the proposed projects, these features may be present and this list should not be considered complete.

Overall it appears that only Lake Sturgeon have changed their designation. All other species are correctly classified.

APPENDIX C: PHOTOGRAPHIC RECORDS

Stantec

APPENDIX C1: SPRING (JUNE 2017)

Stantec

Photo 1: Unnamed Tributary 0A – Upstream culvert, facing downstream.

Photo 2: Unnamed Tributary 0A – Facing downstream towards culvert.

Photo 3: Unnamed Tributary 0A – Facing upstream from culvert towards plunge pool.

Photo 4: Unnamed Tributary 0A – Facing upstream from RoW fence.

Photo 5: Unnamed Tributary 0A – Downstream culvert, facing west.

Photo 6: Unnamed Tributary 0A – Facing west showing downstream flow through RoW.

Photo 7: Unnamed Tributary 0A – Facing downstream from culvert.

Photo 8: Unnamed Tributary 0A – Facing downstream at RoW fence.

Photo 9: Unnamed Tributary 0B – Upstream culvert, facing downstream.

Photo 10: Unnamed Tributary 0B – Facing upstream from culvert.

Photo 11: Unnamed Tributary 0B – Facing upstream from the RoW fence.

Photo 12: Unnamed Tributary 0B – Wetland adjacent to watercourse that drains to watercourse from east side.

Photo 13: Unnamed Tributary 0B – Facing downstream from culvert.

Photo 14: Unnamed Tributary 0B – Downstream overview from culvert.

Photo 15: Unnamed Tributary 0B – Facing west showing previous construction activity.

Photo 16: Unnamed Tributary 0B – Facing west across downstream end of culvert.

Photo 17: Unnamed Tributary 01 – Facing downstream to culvert.

Photo 18: Unnamed Tributary 01 – Upstream overview from culvert.

Photo 19: Unnamed Tributary 01 – Facing upstream (north) showing riffle.

Photo 20: Unnamed Tributary 01 – Facing upstream, beyond RoW.

Photo 21: Unnamed Tributary 01 – Facing upstream to culvert.

Photo 22: Unnamed Tributary 01 – Facing south across watercourse, just downstream of the culvert.

Photo 23: Unnamed Tributary 01 – Facing downstream toward RoW fence.

Photo 24: Unnamed Tributary 01 – Facing downstream, beyond RoW fence.

Photo 25: Unnamed Tributary 02 – Facing south showing wetland pocket within Highway RoW on upstream side.

Photo 26: Unnamed Tributary 02 – Facing west along the north side of the highway.

Photo 27: Unnamed Tributary 02 – Facing upstream toward culvert.

Photo 28: Unnamed Tributary 02 – Facing downstream (south) from culvert.

Photo 29: Unnamed Tributary 02 – Facing downstream from RoW.

Photo 30: Unnamed Tributary 02 – Large seep on east side of culvert.

Photo 31: Unnamed Tributary 02 – Seep and drainage from culvert within embankment on east side.

Photo 32: Unnamed Tributary 02 – West side showing seep and upwelling.

Photo 33: Unnamed Tributary 03 – Facing downstream to culvert.

Photo 34: Unnamed Tributary 03 – Facing upstream (north) from culvert.

Photo 35: Unnamed Tributary 03 – Facing upstream (west) showing drainage from wetland.

Photo 36: Unnamed Tributary 03 – Facing west showing overview of wetland.

Photo 37: Unnamed Tributary 03 – Outlet of drainage from the east, at the highway culvert.

Photo 38: Unnamed Tributary 03 – Facing upstream (east) along highway channel.

Photo 39: Unnamed Tributary 03 - Facing upstream (east) along highway channel.

Photo 40: Unnamed Tributary 03 – Facing north across channelized feature.

Photo 41: Unnamed Tributary 03 - Facing upstream (east) along highway channel.

Photo 42: Unnamed Tributary 03 - Facing upstream (east) from RoW fence.

Photo 43: Unnamed Tributary 03 – Facing upstream towards perched culvert.

Photo 44: Unnamed Tributary 03 – Plunge pool at downstream end of culvert.

Photo 45: Unnamed Tributary 03 – Facing downstream from plunge pool.

Photo 46: Unnamed Tributary 03 – Facing downstream beyond RoW.

Photo 47: Unnamed Tributary 03 – Facing upstream from edge or RoW to culvert.

Photo 48: Unnamed Tributary 03 – Facing south from Highway towards culvert, showing collapsed embankment.

Photo 49: Unnamed Tributary 04 – Facing downstream to culvert.

Photo 50: Unnamed Tributary 04 – Facing downstream showing concrete ledge at culvert inlet.

Photo 51: Unnamed Tributary 04 – Facing downstream through culvert.

Photo 52: Unnamed Tributary 04 – Facing east across upstream side of culvert.

Photo 53: Unnamed Tributary 04 – Facing upstream from culvert.

Photo 54: Unnamed Tributary 04 – Watercress on upstream side.

Photo 55: Unnamed Tributary 04 – Facing upstream to culvert.

Photo 56: Unnamed Tributary 04 – Facing upstream to culvert.

Photo 57: Unnamed Tributary 04 – Facing downstream to RoW fence.

Photo 58: Unnamed Tributary 04 – Facing downstream beyond RoW fence.

Photo 59: Unnamed Tributary 04 – Concrete lip at culvert outlet.

Photo 60: Unnamed Tributary 04 – Facing upstream through culvert.

Photo 61: Unnamed Tributary 06 – Facing west across upstream end of culvert.

Photo 62: Unnamed Tributary 06 – Facing upstream from culvert.

Photo 63: Unnamed Tributary 06 – Facing upstream from RoW fence.

Photo 64: Unnamed Tributary 06 – Facing east along highway drainage flow path.

Photo 65: Unnamed Tributary 06 – Facing east along rip rap that conveys highway drainage.

Photo 66: Unnamed Tributary 06 – Small culvert located east of Unnamed Tributary 06.

Photo 67: Unnamed Tributary 06 – Facing upstream to culvert, showing perched condition.

Photo 68: Unnamed Tributary 06 – Downstream of culvert, facing upstream (north).

Photo 69: Unnamed Tributary 06 – Facing west across watercourse.

Photo 70: Unnamed Tributary 06 – Facing downstream from RoW fence showing woody debris.

Photo 71: Unnamed Tributary 07 – Facing west across upstream end of culvert.

Photo 72: Unnamed Tributary 07 – Facing upstream from culvert.

Photo 73: Unnamed Tributary 07 – Upstream overview from culvert.

Photo 74: Unnamed Tributary 07 – Facing downstream toward culvert.

Photo 75: Facing west across downstream end of culvert.

Photo 76: Unnamed Tributary 07 – Facing downstream from culvert.

Photo 77: Unnamed Tributary 07 – Facing west across downstream side of channel.

Photo 78: Unnamed Tributary 07 – Facing downstream from RoW fence.

Photo 79: Shelter Valley Creek – Facing west across upstream end of culvert.

Photo 80: Shelter Valley Creek – Facing upstream from culvert.

Photo 81: Shelter Valley Creek – Facing upstream approximately 30 m upstream from culvert.

Photo 82: Shelter Valley Creek – Facing downstream through culvert.

Photo 83: Shelter Valley Creek – Facing upstream to culvert.

Photo 84: Shelter Valley Creek – Facing west across watercourse, just downstream of culvert.

Photo 85: Shelter Valley Creek – Facing downstream from riffle.

Photo 86: Shelter Valley Creek –Facing south across large bend downstream of culvert.

Photo 87: Shelter Valley Creek – Large boulder downstream at large bend.

Photo 88: Shelter Valley Creek – Facing downstream from large bend.

Photo 89: Unnamed Tributary 08 – Upstream catch basin.

Photo 90: Unnamed Tributary 08 – Facing upstream along the east side of Vernonville Road.

Photo 91: Unnamed Tributary 08 – Facing east along the south side of Rutherford Road.

Photo 92: Unnamed Tributary 08 – Facing upstream along the east side of Vernonville Road, north of Rutherford Road.

Photo 93: Unnamed Tributary 08 – Downstream culvert, south of bridge.

Photo 94: Unnamed Tributary 08 – Facing downstream from culvert.

Photo 95: Unnamed Tributary 08 – Facing downstream (southeast) away from Vernonville Road RoW.

Photo 96: Unnamed Tributary 08 – Grassy channel within downstream reach of watercourse.

Photo 97: Unnamed Tributary 09 – Upstream side showing culvert inlet.

Photo 98: Unnamed Tributary 09 – Facing upstream from culvert.

Photo 99: Unnamed Tributary 09 – Facing upstream from RoW fence.

Photo 100: Unnamed Tributary 09 – Facing northeast showing drainage channel from beyond Highway RoW.

Photo 101: Unnamed Tributary 09 – Facing west across the downstream end of the culvert.

Photo 102: Unnamed Tributary 09 – Large pool at culvert outlet.

Photo 103: Unnamed Tributary 09 – Downstream overview from culvert.

Photo 104: Unnamed Tributary 09 – Downstream overview from RoW fence.

Photo 105: Unnamed Tributary 10 – Facing downstream to culvert.

Photo 106: Unnamed Tributary 10 – Facing downstream to culvert.

Photo 107: Unnamed Tributary 10 – Facing upstream from culvert.

Photo 108: Unnamed Tributary 10 – Facing upstream from RoW fence.

Photo 109: Unnamed Tributary 10 – Facing upstream to culvert.

Photo 110: Unnamed Tributary 10 – Facing east across large pool.

Photo 111: Unnamed Tributary 10 – Facing downstream to RoW fence.

Photo 112: Unnamed Tributary 10 – Facing downstream (west) along the south side of the RoW fence.

Photo 113: Unnamed Tributary 11 – Facing upstream to culvert.

Photo 114: Unnamed Tributary 11 – Facing west across upstream channel.

Photo 115: Unnamed Tributary 11 – Upstream overview from channel.

Photo 116: Unnamed Tributary 11 – Facing east showing side drainage channel.

Photo 117: Unnamed Tributary 11 – Facing downstream from culvert.

Photo 118: Unnamed Tributary 11 – Downstream overview from culvert.

Photo 119: Unnamed Tributary 11 – Channel at RoW fence.

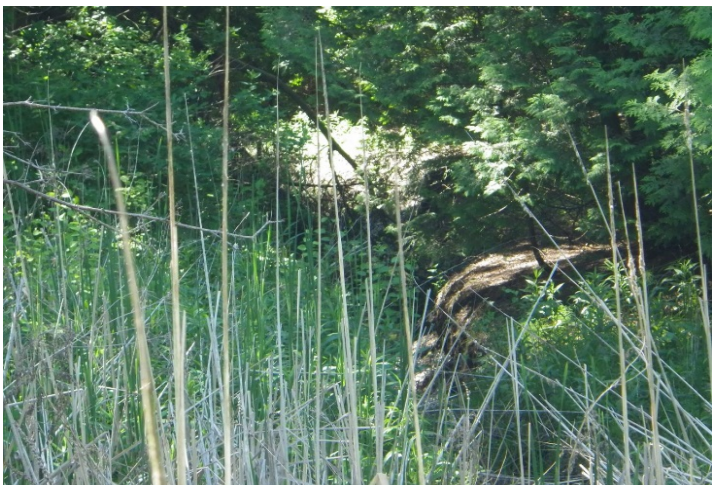


Photo 120: Unnamed Tributary 11 – Facing south from RoW fence showing channelized feature.

Photo 121: Unnamed Tributary 12 - Facing downstream showing upstream end of culvert.

Photo 122: Unnamed Tributary 12 – Facing downstream from culvert.

Photo 123: Unnamed Tributary 12 – Downstream overview from culvert.

Photo 124: Unnamed Tributary 12 – Downstream overview to RoW fence.

Photo 125: Unnamed Tributary 12 – Downstream overview from RoW fence.

Photo 126: Unnamed Tributary 12 – Drainage from Highway.

Photo 127: Unnamed Tributary 13 – Upstream culvert and catch basin.

Photo 128: Unnamed Tributary 13 – Facing north showing upstream channel.

Photo 129: Unnamed Tributary 13 – Upstream overview from RoW fence.

Photo 130: Unnamed Tributary 13 – Facing upstream to culvert.

Photo 131: Unnamed Tributary 13 – Facing downstream showing concrete apron and plunge pool.

Photo 132: Unnamed Tributary 13 – Downstream overview from plunge pool.

Photo 133: Unnamed Tributary 13 – Small cascade downstream within interchange.

Photo 134: Unnamed Tributary 13 – Downstream overview within interchange.

Photo 135: Unnamed Tributary 13 – Facing downstream to interchange culvert.

Photo 136: Unnamed Tributary 13 – Facing downstream from the Percy Street Road interchange culvert.

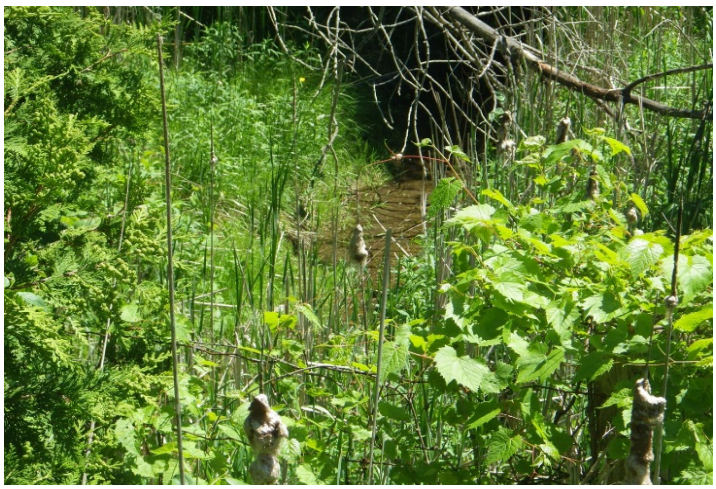


Photo 137: Unnamed Tributary 13 – Facing downstream from downstream of the Percy Street Road interchange culvert.

Photo 138: Click here to enter text.

APPENDIX C2: SUMMER (SEPTEMBER 2017)

Stantec

Photo 1: Unnamed Tributary 0A – Upstream culvert, facing downstream.

Photo 2: Unnamed Tributary 0A – Facing upstream from culvert.

Photo 3: Unnamed Tributary 0A – Facing upstream towards RoW fence.

Photo 4: Unnamed Tributary 0A – Facing upstream beyond RoW fence.

Photo 5: Unnamed Tributary 0A – Downstream culvert, facing upstream.

Photo 6: Unnamed Tributary 0A – Facing downstream from culvert.

Photo 7: Unnamed Tributary 0A – Facing downstream towards RoW fence and beyond.

Photo 8: Unnamed Tributary 0A – Facing east from downstream culvert.

Photo 9: Unnamed Tributary 0B – Upstream culvert, facing downstream.

Photo 10: Unnamed Tributary 0B – Facing upstream from culvert.

Photo 11: Unnamed Tributary 0B – Facing upstream beyond RoW.

Photo 12: Unnamed Tributary 0B – Facing north, showing adjacent wetland on west side of the tributary.

Photo 13: Unnamed Tributary 0B – Downstream culvert, facing upstream.

Photo 14: Unnamed Tributary 0B – Downstream (south) overview from culvert.

Photo 15: Unnamed Tributary 0B – Facing downstream beyond RoW.

Photo 16: Unnamed Tributary 0B – Facing west, east of culvert and tributary.

Photo 17: Unnamed Tributary 0C – Facing west towards upstream culvert.

Photo 18: Unnamed Tributary 0C – Upstream culvert, facing downstream.

Photo 19: Unnamed Tributary 0C – Facing upstream from culvert.

Photo 20: Unnamed Tributary 0C – Facing upstream at RoW fence.

Photo 21: Unnamed Tributary 0C – Downstream culvert, facing upstream.

Photo 22: Unnamed Tributary 0C – Facing downstream from culvert.

Photo 23: Unnamed Tributary 0C – Facing downstream beyond RoW fence.

Photo 24: Unnamed Tributary 0C – Downstream overview by highway, above downstream culvert.

Photo 25: Unnamed Tributary 01 – Upstream culvert, facing downstream.

Photo 26: Unnamed Tributary 01 – Facing upstream (north) from culvert.

Photo 27: Unnamed Tributary 01 – Iron staining on west side of culvert.

Photo 28: Unnamed tributary 01 – Facing upstream beyond RoW fence.

Photo 29: Unnamed Tributary 01 – Downstream culvert, facing upstream.

Photo 30: Unnamed Tributary 01 – Facing downstream from culvert.

Photo 31: Unnamed Tributary 01 – Facing farther downstream from culvert.

Photo 32: Unnamed Tributary 01 – Facing downstream from RoW.

Photo 33: Unnamed Tributary 02 – Upstream catch basins.

Photo 34: Unnamed Tributary 02 – Facing west from catch basins.

Photo 35: Unnamed Tributary 02 – Facing east from catch basins.

Photo 36: Unnamed Tributary 02 – West overview above catch basins.

Photo 37: Unnamed Tributary 02 – Downstream culvert, facing upstream.

Photo 38: Unnamed Tributary 02 – Facing downstream (south) from culvert.

Photo 39: Unnamed Tributary 02 – Facing downstream beyond RoW.

Photo 40: Unnamed Tributary 02 – Seep on east side of culvert.

Photo 41: Unnamed Tributary 02 – Seep and drainage from culvert within embankment on east side.

Photo 42: Unnamed Tributary 02 – Seep on west side of culvert.

Photo 43: Unnamed Tributary 03 – Upstream culvert, facing downstream.

Photo 44: Unnamed Tributary 03 – Facing upstream from culvert, at watercress.

Photo 45: Unnamed Tributary 03 – Facing east towards upstream culvert.

Photo 46: Unnamed Tributary 03 – Cement culvert located farther west from upstream culvert.

Photo 47: Unnamed Tributary 03 – Downstream culvert, facing upstream towards perched culvert.

Photo 48: Unnamed Tributary 03 – Plunge pool at downstream end of culvert.

Photo 49: Unnamed Tributary 03 – Facing farther downstream past plunge pool.

Photo 50: Unnamed Tributary 03 – Facing farther downstream from culvert.

Photo 51: Unnamed Tributary 03 – Facing downstream beyond RoW.

Photo 52: Unnamed Tributary 03 – Facing upstream at east side of culvert, showing collapsed embankment and erosion.

Photo 53: Unnamed Tributary 04 – Upstream culvert, facing downstream.

Photo 54: Unnamed Tributary 04 – Facing east at culvert, showing concrete ledge at culvert inlet.

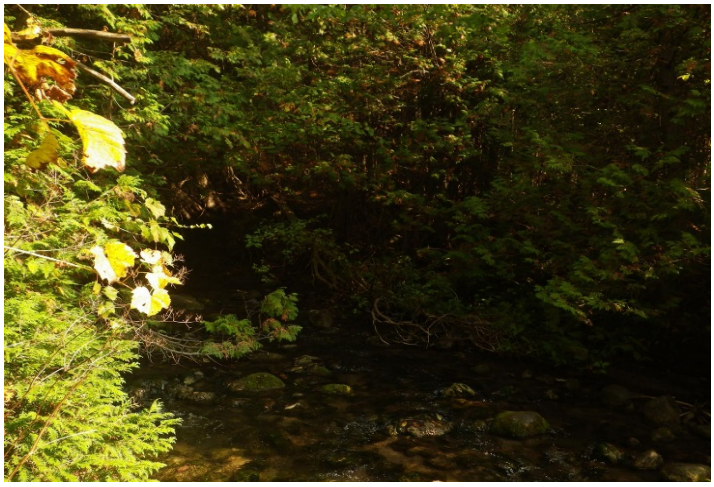


Photo 55: Unnamed Tributary 04 – Facing upstream (north), away from culvert.

Photo 56: Unnamed Tributary 04 – Facing upstream beyond RoW fence.

Photo 57: Unnamed Tributary 04 – Downstream culvert, facing upstream.

Photo 58: Unnamed Tributary 04 – Facing downstream from culvert.

Photo 59: Unnamed Tributary 04 – Facing downstream beyond RoW.

Photo 60: Unnamed Tributary 04 – Facing upstream, showing concrete lip at culvert outlet.

Photo 61: Unnamed Tributary 04 – Facing upstream through culvert.

Photo 62: Unnamed Tributary 04 – Iron staining and watercress on east bank, facing upstream.

Photo 63: Unnamed Tributary 06 – Facing west, down embankment towards upstream culvert.

Photo 64: Unnamed Tributary 06 – Facing upstream above culvert, towards RoW fence.

Photo 65: Unnamed Tributary 06 – Upstream overview beyond RoW fence.

Photo 66: Unnamed Tributary 06 – Highway culvert drainage outlet, located east of tributary culvert.

Photo 67: Unnamed Tributary 06 – Downstream culvert, facing upstream, showing perched condition.

Photo 68: Unnamed Tributary 06 – Facing downstream from culvert.

Photo 69: Unnamed Tributary 06 – Upstream overview, facing north towards culvert.

Photo 70: Unnamed Tributary 06 – Facing downstream beyond RoW.

Photo 71: Unnamed Tributary 07 – Upstream culvert, facing downstream.

Photo 72: Unnamed Tributary 07 – Facing upstream from culvert.

Photo 73: Unnamed Tributary 07 – Facing farther upstream towards RoW fence.

Photo 74: Unnamed Tributary 07 – Facing upstream beyond RoW fence.

Photo 75: Unnamed Tributary 07 – Downstream culvert, facing upstream.

Photo 76: Unnamed Tributary 07 – Facing upstream at culvert from RoW fence.

Photo 77: Unnamed Tributary 07 – Facing downstream towards RoW fence.

Photo 78: Unnamed Tributary 07 – Facing downstream beyond RoW fence.

Photo 79: Shelter Valley Creek – Facing downstream at upstream end of culvert.

Photo 80: Shelter Valley Creek – Facing upstream from culvert.

Photo 81: Shelter Valley Creek – Facing upstream approximately 10 m upstream from culvert.

Photo 82: Shelter Valley Creek – Facing upstream through culvert.

Photo 83: Shelter Valley Creek – Facing upstream through culvert, at downstream end of culvert.

Photo 84: Shelter Valley Creek – Facing downstream at downstream riffle.

Photo 85: Shelter Valley Creek – Facing downstream overview, just beyond riffle.

Photo 86: Shelter Valley Creek – Iron stains on east side of downstream culvert end.

Photo 87: Shelter Valley Creek – Facing south across large bend downstream of culvert.

Photo 88: Shelter Valley Creek – Facing downstream beyond large bend.

Photo 89: Unnamed Tributary 08 – Upstream catch basin located east of Vernonville Road, north of bridge.

Photo 90: Unnamed Tributary 08 – Facing upstream from catch basin, along east side of Vernonville Road.

Photo 91: Unnamed Tributary 08 – Facing east along the south side of Rutherford Road.

Photo 92: Unnamed Tributary 08 - Facing upstream along the east side of Vernonville Road, north of Rutherford Road.

Photo 93: Unnamed Tributary 08 – North of bridge, facing downstream (south) along west side of Vernonville Road.

Photo 91: Unnamed Tributary 08 – Upstream catch basin located west of Vernonville Road, north of bridge.

Photo 92: Unnamed Tributary 08 – Downstream culvert, south of bridge, located east of Vernonville Road.

Photo 93: Unnamed Tributary 08 – Facing downstream from east culvert.

Photo 94: Unnamed Tributary 08 – Facing farther downstream, southeast, away from Vernonville Road RoW.

Photo 95: Unnamed Tributary 08 – Facing downstream on west side of Vernonville Road, south of bridge.

Photo 96: Unnamed Tributary 08 – Facing upstream (north) on west side of Vernonville Road, south of bridge.

Photo 97: Unnamed Tributary 08 – Downstream culvert located west of Vernonville Road, facing upstream.

Photo 98: Unnamed Tributary 09 – Upstream culvert, facing downstream.

Photo 99: Unnamed Tributary 09 – Facing upstream of main channel from culvert towards RoW fence.

Photo 100: Unnamed Tributary 09 – Facing upstream beyond RoW fence.

Photo 101: Unnamed Tributary 09 – Side channel of west side of culvert.

Photo 102: Unnamed Tributary 09 – Facing upstream of side channel on west side of culvert.

Photo 103: Unnamed Tributary 09 – Facing farther upstream of west side channel, beyond RoW fence.

Photo 104: Unnamed Tributary 09 – Downstream culvert, facing upstream.

Photo 105: Unnamed Tributary 09 – Facing downstream away from culvert, towards RoW fence.

Photo 106: Unnamed Tributary 09 – Large pool at culvert outlet.

Photo 107: Unnamed Tributary 09 – Small side channel on east bank by RoW fence.

Photo 108: Unnamed Tributary 09 – Iron staining on east bank.

Photo 109: Unnamed Tributary 09 – Downstream overview from highway, facing downstream.

Photo 110: Unnamed Tributary 10 – Upstream culvert, facing downstream.

Photo 111: Unnamed Tributary 10 – Facing upstream from culvert.

Photo 112: Unnamed Tributary 10 – Facing upstream towards RoW fence.

Photo 113: Unnamed Tributary 10 – Facing upstream beyond RoW fence.

Photo 114: Unnamed Tributary 10 – Downstream culvert, facing upstream, and showing large pool.

Photo 115: Unnamed Tributary 10 – Facing downstream from large pool.

Photo 116: Unnamed Tributary 10 – Facing downstream towards RoW fence.

Photo 117: Unnamed Tributary 10 – Facing downstream beyond RoW fence.

Photo 118: Unnamed Tributary 11 – Upstream culvert, facing downstream.

Photo 119: Unnamed Tributary 11 – Facing upstream from culvert.

Photo 120: Unnamed Tributary 11 – Facing east towards dry side channel.

Photo 121: Unnamed Tributary 11 – Facing west towards culvert, from dry east side channel.

Photo 122: Unnamed Tributary 11 – Downstream culvert, facing upstream.

Photo 123: Unnamed Tributary 11 – Facing downstream from culvert.

Photo 124: Unnamed Tributary 11 – Facing upstream from RoW fence.

Photo 125: Unnamed Tributary 11 – Facing downstream towards RoW fence.

Photo 126: Unnamed Tributary 12 – Upstream culvert, facing downstream.

Photo 127: Unnamed Tributary 12 – Facing upstream towards RoW fence.

Photo 128: Unnamed Tributary 12 – Facing upstream beyond RoW fence.

Photo 129: Unnamed Tributary 12 - Erosion channel on west bank, embankment runoff.

Photo 130: Unnamed Tributary 12 – Downstream culvert, facing upstream.

Photo 131: Unnamed Tributary 12 – Facing downstream towards RoW fence.

Photo 132: Unnamed Tributary 12 – Facing downstream beyond RoW fence.

Photo 133: Unnamed Tributary 12 – Iron staining on East bank by RoW fence.

Photo 134: Unnamed Tributary 13 – Upstream culvert and catch basin.

Photo 135: Unnamed Tributary 13 – Upstream channel (dry), facing west.

Photo 136: Unnamed Tributary 13 – Facing upstream to culvert.

Photo 137: Unnamed Tributary 13 – Facing upstream, showing concrete apron and plunge pool.

Photo 138: Unnamed Tributary 13 – Upstream overview within interchange.

Photo 139: Unnamed Tributary 13 – Facing downstream towards interchange culvert.

APPENDIX D: FIELD DATA SHEETS

Stantec

APPENDIX D1: SPRING (JUNE 2017)

Stantec

Watercourse Field Record Form

Trib ØA

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1105001057	Hwy 401	13	June	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & ME	rain + hot	3 p.m.	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	17.1°C DO = 8.1	461 pH = 7.27

PHOTO NUMBERS AND DESCRIPTIONS: d/s: 1035-1047 u/s: 1071-1088

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unamed Trib ØA	L. ON.		Trib ØA

LOCATION OF CROSSING: east of Nagle Rd.

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 728196 E 4875011 N	
TOWNSHIP:	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Commercial	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
25 u/s 25 d/s	

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other: cascade
Percentage of area		15 / 30	45 / 90	40		
Mean depth wetted (m)		0.4 / 0.3	0.05 / 0.05	0.1		45cm drop
Mean width wetted (m)		2 / 2	2.5 / 1-1.6	0.4-2		
Mean bankfull width (m)		2 / 4	5 / 3	2		
Mean bankfull depth(m)		n/m / 0.9	0.6 / 0.6	0.5		
Substrate		cl / co si	co / co	Sa Si D		

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

OA

Watercourse Field Record Form

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☒	☐	☐	☐
Right Upstream Bank	☒	☐	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
			15	Instream Overhanging		Instream Overhanging 5	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species			Juncus CT grasses	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		low flow	Cascade for small barrier

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		Fe seep @ ROW fence d/s	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

Fe u/s

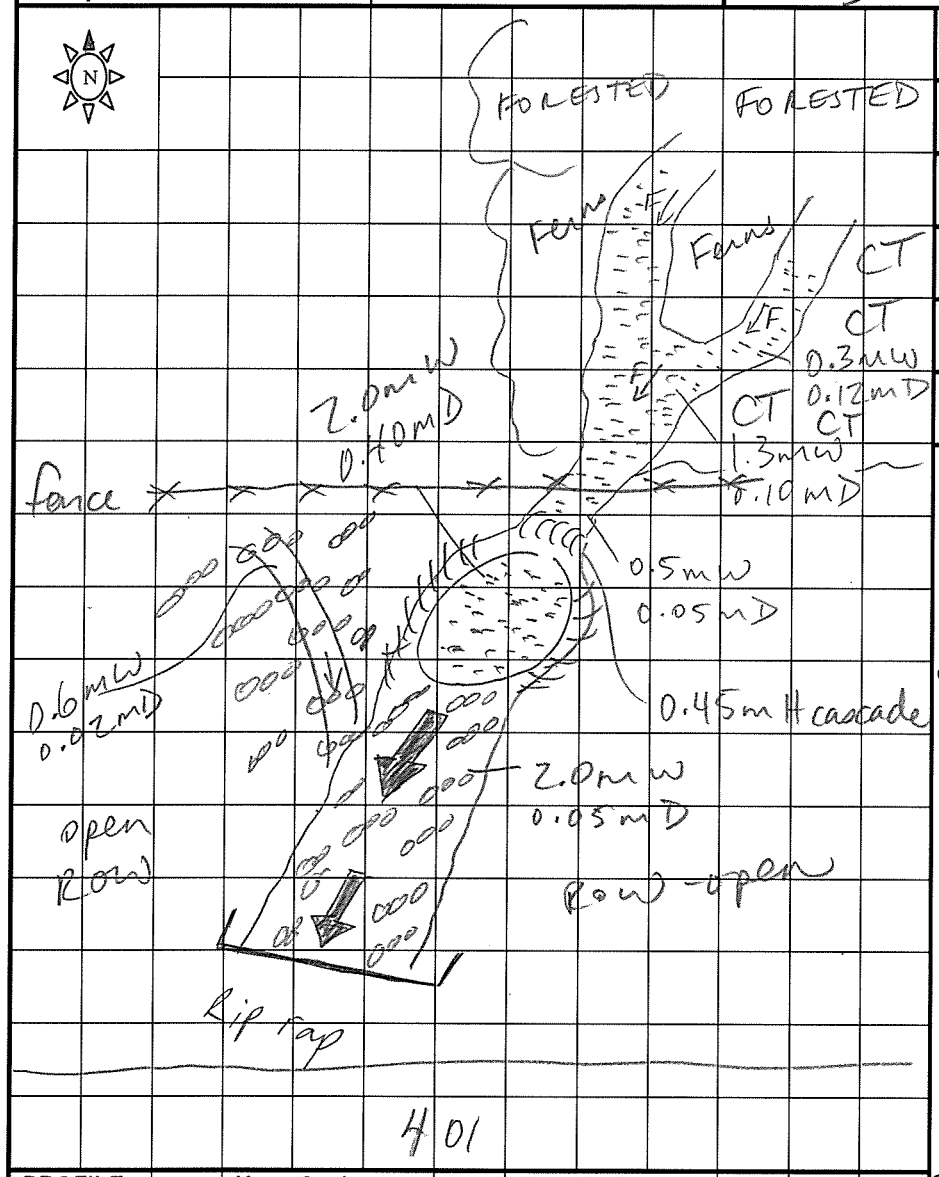
COMMENTS:

- u/s - swamp drainage 0.4-2m wide, flat over Rue
  - cascade 45cm drop into plunge pool eroded banks & clay substrate
  - riffle over riverstone to culvert 2.5 x 0.05
  - cyprinids (likely blacknose) in plunge pool
- d/s - cobble lined riffle/pool/riffle/pool 1-1.6m wide & 0.05-0.3m
  - recently reconstructed riverstone lined
  - ditch drainage from east

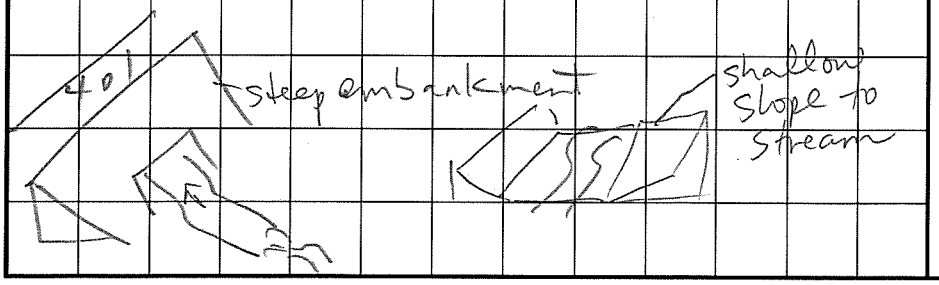
Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Trib 0-a

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Trib 0-a	25	1/1



PROFILE: Horz. Scale Vert. Scale



PROJECT #: 165001057

MAPPER: mellah

NAME OF WATERBODY: Trib 0-a

CROSSING #:

STATION #: upstream

DATE: DD-MMM-YY 13-JUN-17

LEGEND

F flat
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

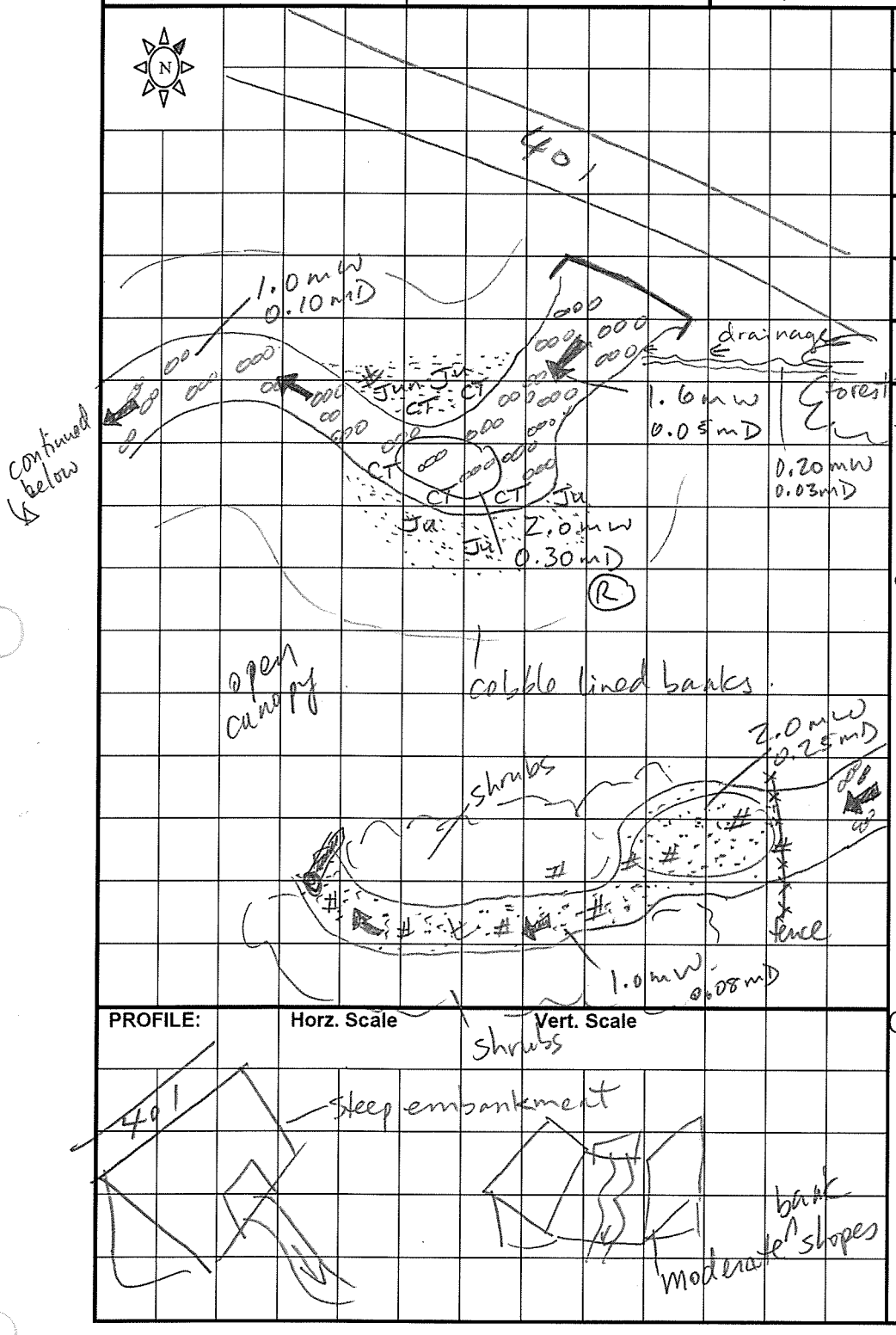
⊢► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
⊔ Culvert

Trib 0-a

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 0-a	25	1/1



PROFILE: Horz. Scale Vert. Scale

PROJECT #:	165001057
MAPPER:	MEllah
NAME OF WATERBODY:	Trib 0-a
CROSSING #:	
STATION #:	downstream
DATE: DD-MMM-YY	12-JUN-17

LEGEND

Ju - Juncus sp.

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

Watercourse Field Record Form — Trib ØB

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
10500105 7	Hwy 401	13	June	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☑ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & ME	overcast + hot	3:30 pm	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	15.7° DO= 11.99	448 pH 7.74

PHOTO NUMBERS AND DESCRIPTIONS: d/s: 1048 - 1056 u/s: 1057 - 1070

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. ØB	L.O.N.	—	Trib ØB

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 729475 E 4875475 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
cedar bush	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☒	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m² 4m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
30m u/s + 25 d/s	mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	90 / 50		10 / 50			
Mean depth wetted (m)	0.3 / 0.2-0.3		0.15 / 0.15			
Mean width wetted (m)	2.5 / 2.5-3		2.5 / 2.5			
Mean bankfull width (m)	4 / 3.5		4 / 3			
Mean bankfull depth(m)	0.7 / 0.7		0.5 / 0.3			
Substrate	Co Gr Sa Si / Sa Si Gr		Co Sa Gr / Co Sa Gr			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 03.

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☑	☐	☑
Right Upstream Bank	☐	☒	☐	☒

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	5	/	15	Instream / Overhanging /	/	Instream 5 Overhanging 5	70

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☐	☒	☐

VEGETATION TYPE (%):	Submergent 1	Floating /	Emergent 4	None 95
Predominant Species	speedwell	/	CT bulrush	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	/	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout.	Fe @ d/s culvert west side	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

↑ riparian cover.

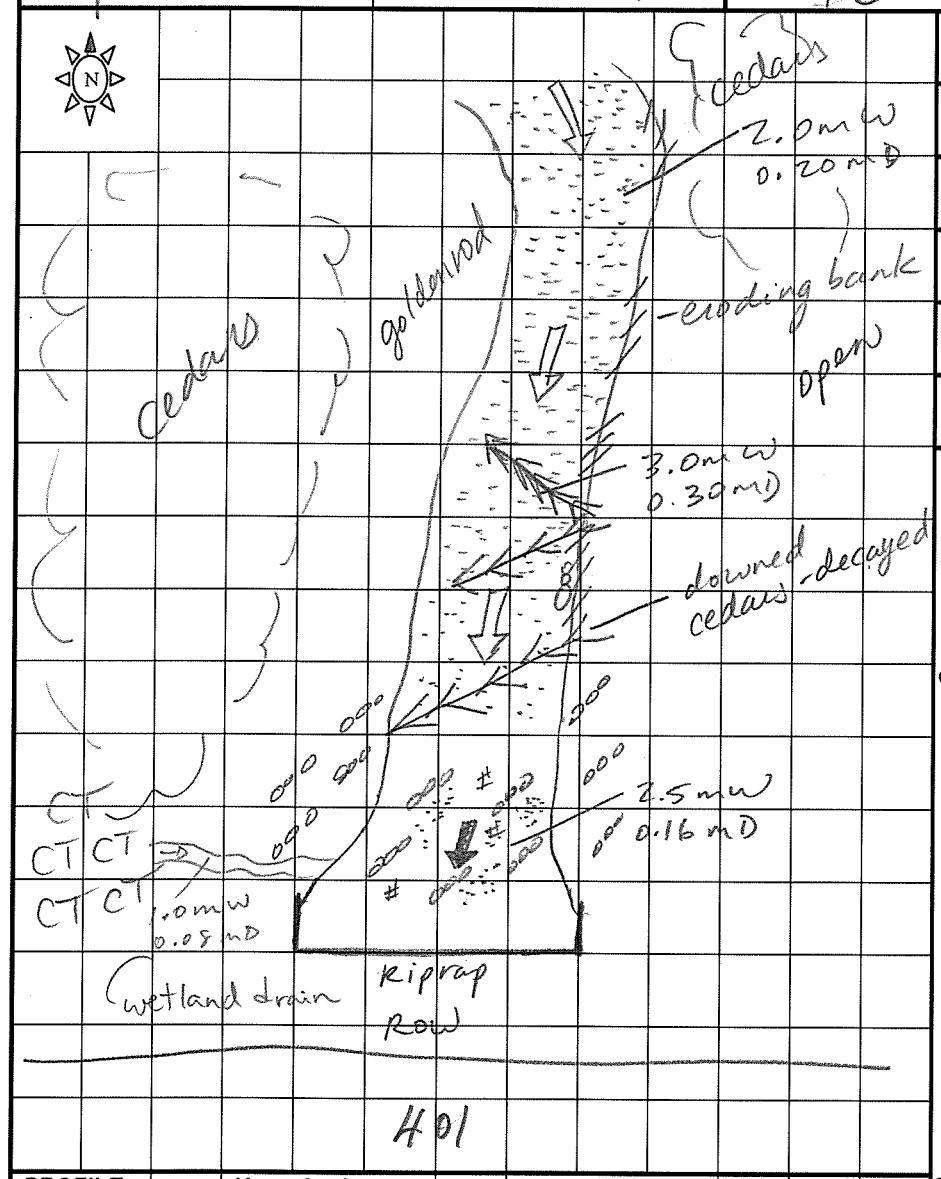
COMMENTS:

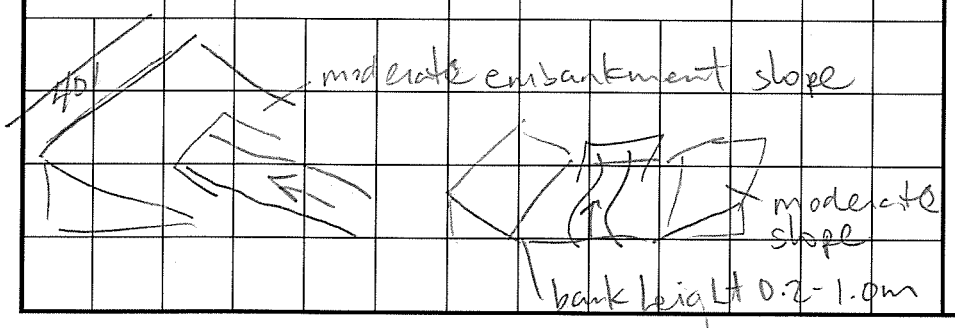
- u/s - unstable, collapsing banks.
  - run, riffle @ culvert 2.5 m wide 0.3 m deep
  - beyond ROW si/sa substrates. riverstone @ culvert & ROW
  - wetland drainage from west side of culvert.
- d/s - cyprinids observed at culvert
  - run/riffle sequence 2.5 m + 0.05-0.3 m deep riffle run
    Gr/Co u/l some fines (sa/si)

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Trib 0-6

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Trib 0-6	40	1/1





PROJECT #: 16500/057

MAPPER: MEllah

NAME OF WATERBODY: Trib 0-6

CROSSING #:

STATION #: upstream

DATE: DD-MMM-YY 13-JUN-17

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

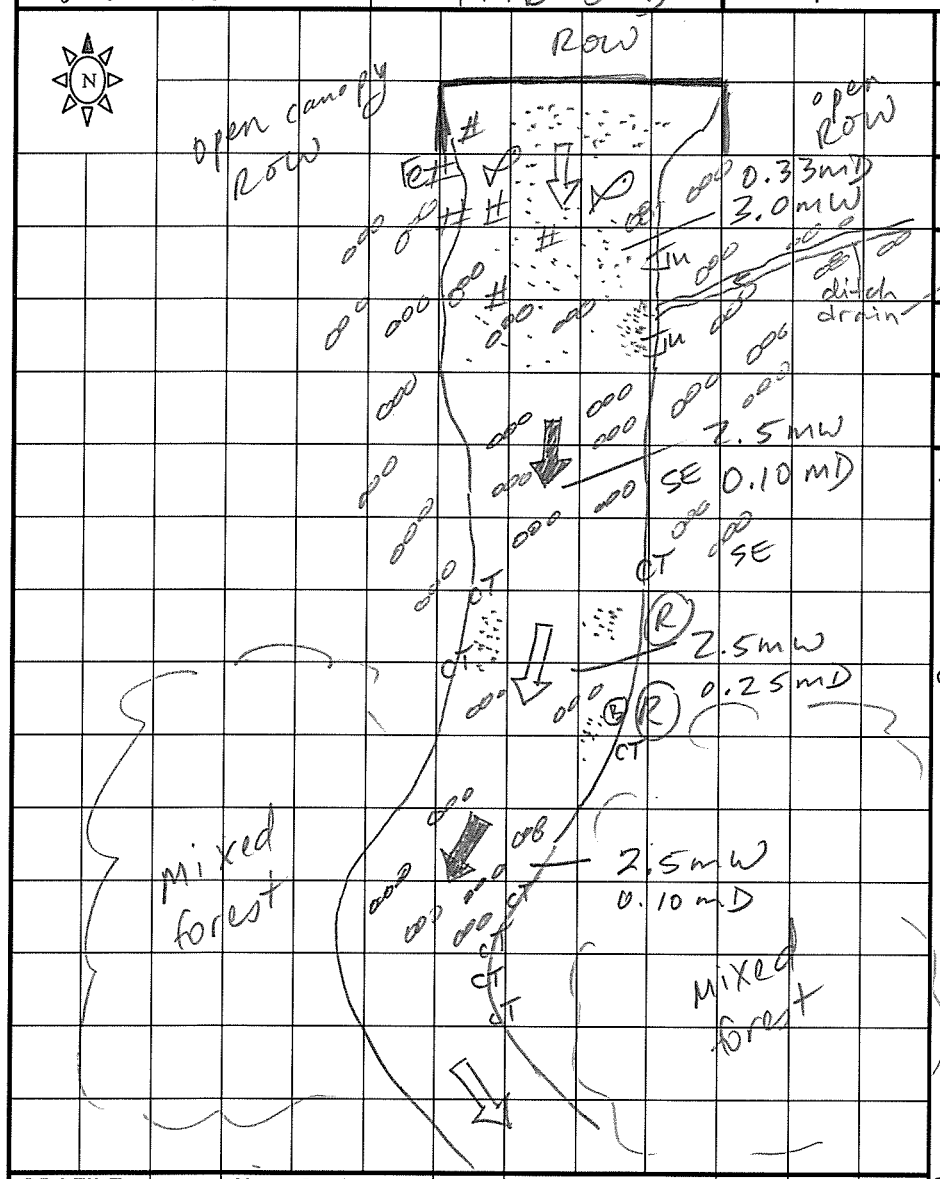
⊢▶ Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

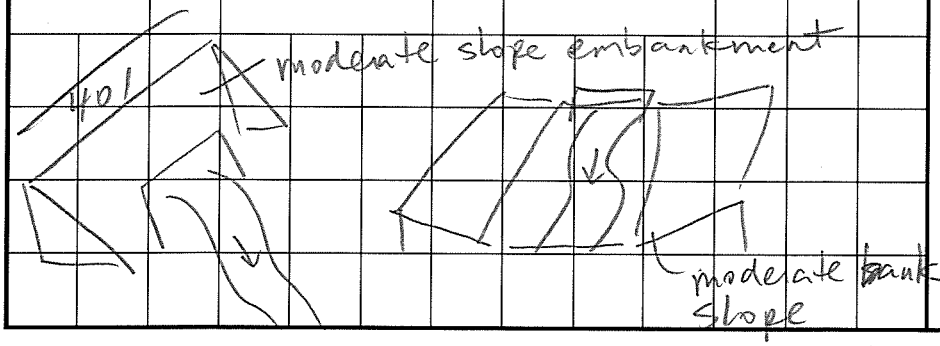
-x--x- Fence line
⊔ Culvert

Trib 0-b

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 0-b	40	1 | 1



PROFILE: Horz. Scale Vert. Scale



PROJECT #: 165001057

MAPPER: MEllah

NAME OF WATERBODY: Trib 0-b

CROSSING #: diffuse flow in ditch

STATION #: downstream

DATE: DD-MMM-YY 13 JUN-17

LEGEND

Ju - juncus sp.

10d depth (cm)
6w width

SE - sedges sp.

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


- fish school

▒ 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

Watercourse Field Record Form — Trib 1

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650010057	401 Cobourg	7	June	2017

Is STREAM REALIGNMENT required for this section: ☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + ME	sunny & warm	8:30	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	9.5° DO = 11.52	345 pH = 8.21

PHOTO NUMBERS AND DESCRIPTIONS: d/s: 678 - 696 u/s: 1029 - 1034

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Unnamed trib 1	L. ON.	—	trib 1

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 732308 E 4876453 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Cedar forest d/s.	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☒	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m² 25 m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
	Mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other: cascade
Percentage of area	50	24	100 / 25			1
Mean depth wetted (m)	0.2	0.4	0.15 / 0.15			0.25
Mean width wetted (m)	~2.5	2-3	2 / 1.0			2
Mean bankfull width (m)	5	5	3 / 5			3m
Mean bankfull depth(m)	0.5	0.8	~0.5 m / 0.5			0.5 m
Substrate	Sa Gr	Gr Sa	Bo Sa Gr / ar.			Sa Gr

drop ~30cm

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 1

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	10	1	/	Instream 10 Overhanging 5	/	Instream 0 Overhanging 5	70

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☒ d/s.	☐	☐	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
	/	/	/	/
Predominant Species	/	/	/	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	/	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout, gravel	Fe staining @ d/s culvert seep. from embankment d/s.	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

- ↑ instream cover

COMMENTS:

- u/s - large riffle flowing down gradient over Bo — 3m wide & 0.15 m deep bank erosion u/s right side
  - dense cedar bush trickle down embankment
  - ditch drainage both sides
  - none CG/Gnauls @ top of riffle, over boulders, beyond RoW.
- d/s - riffle/pool/riffle/pool/run/cascade sequence over gravel & sand, 1-3m wide & 0.15-0.45 m deep
  - flows into cattail area d/s, beyond RoW

Additional Notes Appended? ☐ No ☐ Yes number of pages ______

Fish Community Inventory Record Form

Trib 1

GENERAL INFORMATION				
PROJECT #: 1650001057	PROJECT DESCRIPTION: Hwy 401	DAY: 14	MONTH: June	YEAR: 2017
COLLECTORS: KE & ME		TIME STARTED: 8:30 AM	TIME FINISHED:	
WEATHER CONDITIONS: sunny & warm	SURFACE CONDITIONS (if applicable): Calm O	Rippled ⊘	Wavy O	Rough O

GENERAL LOCATION	
NAME OF WATERBODY: Unnamed Trib. 1	LOCATION OF STATION:
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ⊘	Yellow/brown O	Blue/green O	Turbid O	Other O

GEAR		
ELECTROFISHER: ⊘		
Length (m): 30 m 401 ROW	Settings: 150 V 30 Hz	Seconds: 207
NETS and TRAPS:		
MINNOW TRAP: O #	DIP NET O	TRAP NET O
SEINE: O	GILL O	OTHER O specify
HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
FISH KEPT? O Yes ⊘ No	# OF BAGS	PRESERVATIVE: Formalin O	Frozen O	Alcohol O	Other O

COMMENTS:

Additional Notes Appended? o No o Yes number of pages _____

Fish Community Inventory Record Form

Trib 1

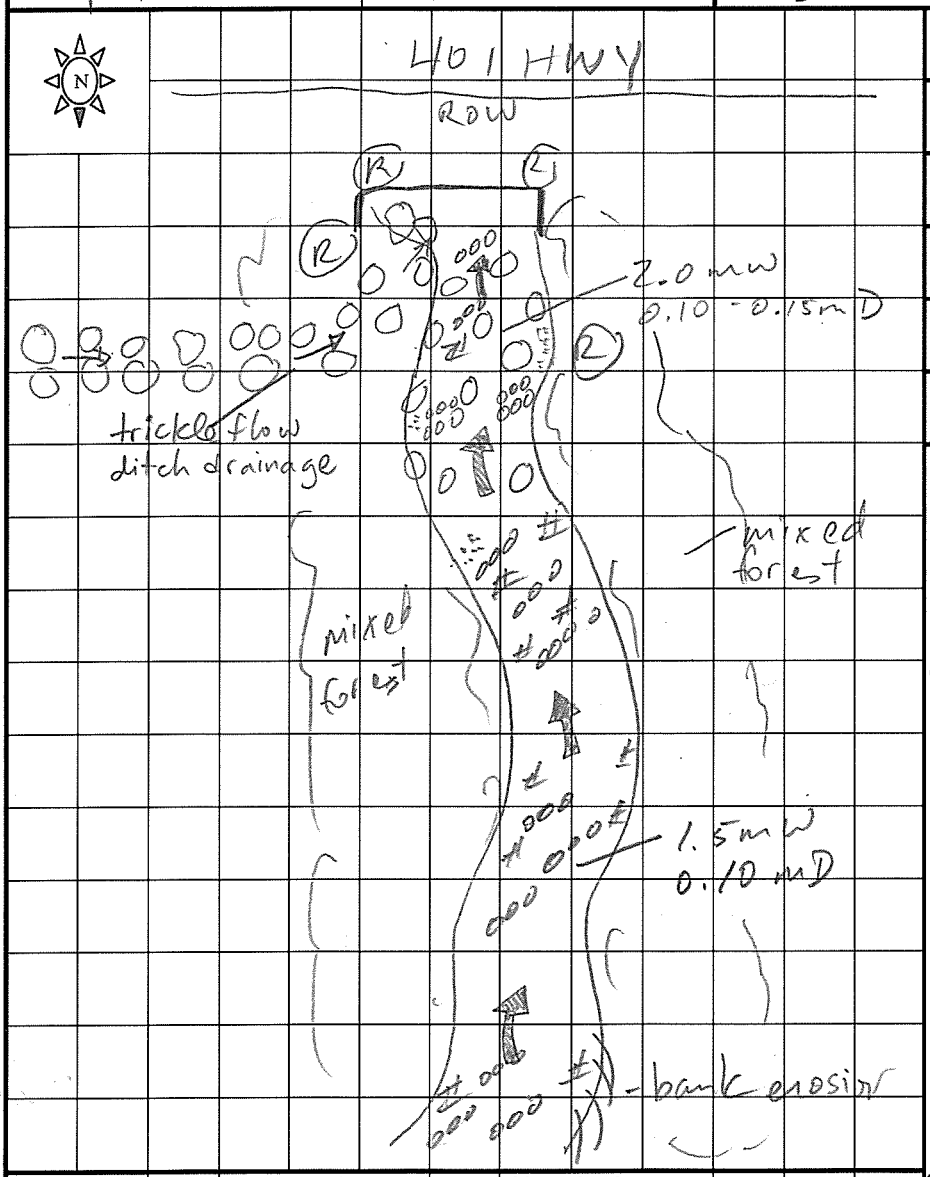
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
1	Brook Trout				J
1	Brook Trout				YOY

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 1

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Upstream	Trib 1	20	1 / 1



PROJECT #:
165001057
MAPPER:
mEllah
NAME OF WATERBODY:
Trib 1
CROSSING #:
STATION #:
upstream
DATE: DD-MMM-YY
13-JUN-17

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

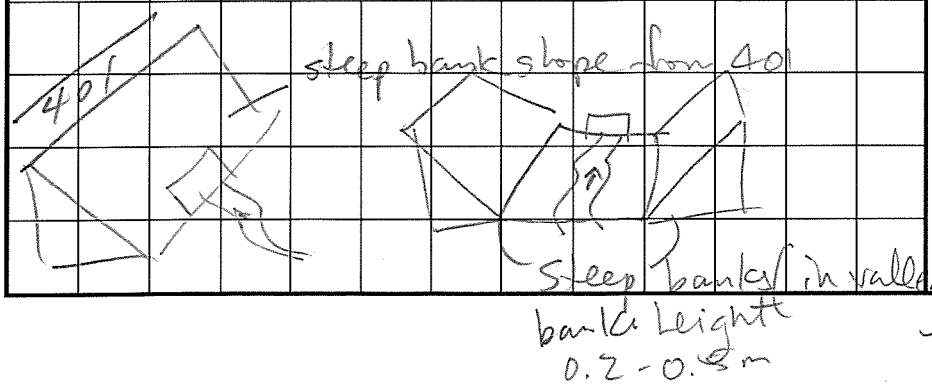
® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

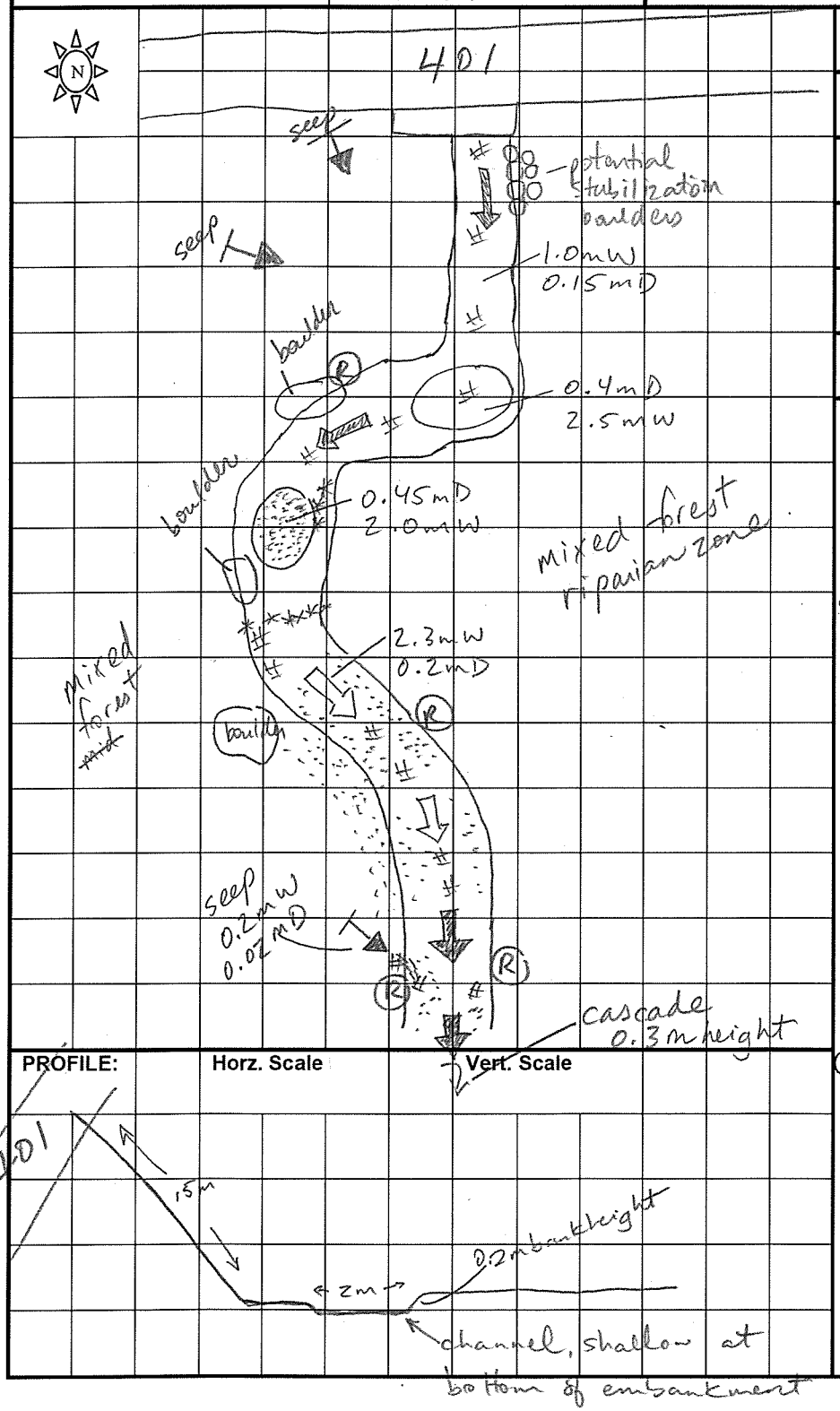
-X--X- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**



Trib 1

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 1	20	1/1



PROJECT #: 165001057

MAPPER: MEllah

NAME OF WATERBODY: Trib 1

CROSSING #:

STATION #: downstream

DATE: DD-MMM-YY 07-06-17

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

Watercourse Field Record Form — Trib 2

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
165001057	Hwy 401 Cobourg	7	June	2017

Is STREAM REALIGNMENT required for this section: ☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + ME	sunny & warm	9:25	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	9.1 DO = 11.42	364 pH 8.21

PHOTO NUMBERS AND DESCRIPTIONS: d/s: 697-715 u/s: 1023-1028

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Trib 2	L. ON.	—	Trib 2

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 733246 E 4876374 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
mixed forest	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☒	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2 3.8 m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	yes CT wetland

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
	mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other wetland?
Percentage of area	40	50	10			100
Mean depth wetted (m)	0.25	0.8	0.15			0.3
Mean width wetted (m)	18.2	4.5	2			ROW
Mean bankfull width (m)	2-2.5	5	2.5			ROW
Mean bankfull depth(m)	0.6	>1m	0.6			0.5
Substrate	co Gr Sa	sa Gr Co	co Gr			Si Mu D

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

u/s no access North of North unnamed Heights

Watercourse Field Record Form

Trib 2

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
				Instream / Overhanging		Instream / Overhanging	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species		tape grass	cattails	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	trout	Fe stains + 2 seeps on each side d/s culvert	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - CT wetland in ROW blw Northumberland Heights + 401
  - confined to ROW, no culvert on road
  - ~100m long u/s in ROW.
  - 90% cattails
  - ★ - not likely u/s source, topo indicates culvert passes through ROW + under Northumberland Heights + into bush right of road
- d/s - large pool 80cm deep 4.5m wide @ culvert, school large fish observed, sa/gr/co substrates
  - narrows to run 1.8-2m wide @ 25cm deep cb-co/gr/sa
  - riffle @ fence ~2m wide

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 2

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
165001057	Hwy 401	13	June	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE & ME		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm ❑	Rippled ❑	Wavy ❑	Rough ❑

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 2	
TOWNSHIP:	**MNR DISTRICT:** Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ❑	Yellow/brown ❑	Blue/green ❑	Turbid ❑	Other ❑

GEAR

ELECTROFISHER: ☑

Length (m): 20 m d/s ROW	Settings: 200V 30Hz	Seconds: 246 s.

NETS and TRAPS:

MINNOW TRAP: ❑ #	DIP NET ❑	TRAP NET ❑
SEINE: ❑	GILL ❑	OTHER ❑ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ❑ Yes ❑ No	# OF BAGS	PRESERVATIVE:			
		Formalin ❑	Frozen ❑	Alcohol ❑	Other ❑

COMMENTS:

Additional Notes Appended? ❑ No ❑ Yes number of pages _____

Fish Community Inventory Record Form

Trib 2

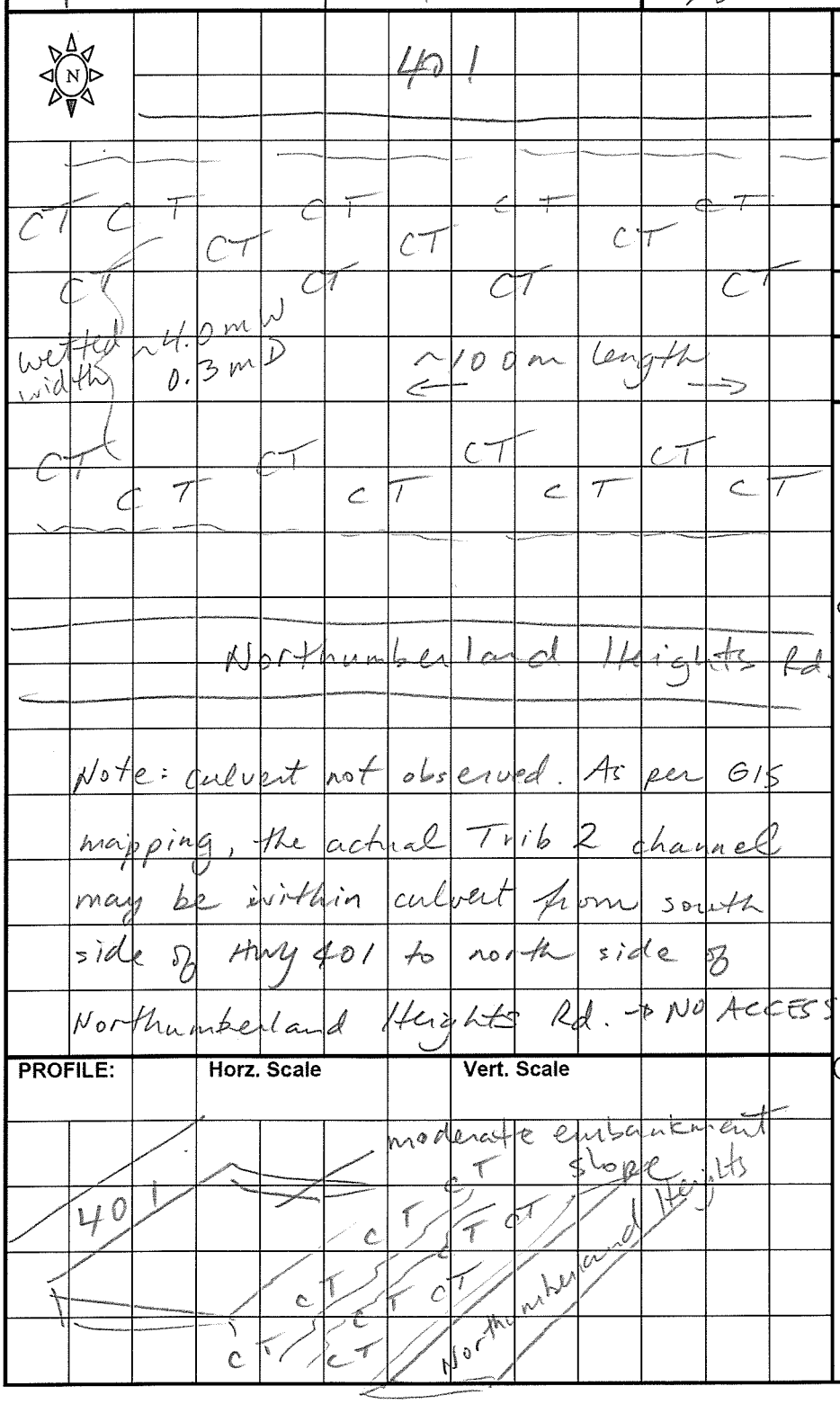
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
☒☒	Brook Trout				A+J
					A
" "	Rainbow Trout				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 2

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Trib 2	100	1 / 1



PROJECT #: 165001057

MAPPER: McEllan

NAME OF WATERBODY: Trib 2

CROSSING #:

STATION #: upstream - Trib2

DATE: DD-MMM-YY: 13-JUN-17

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

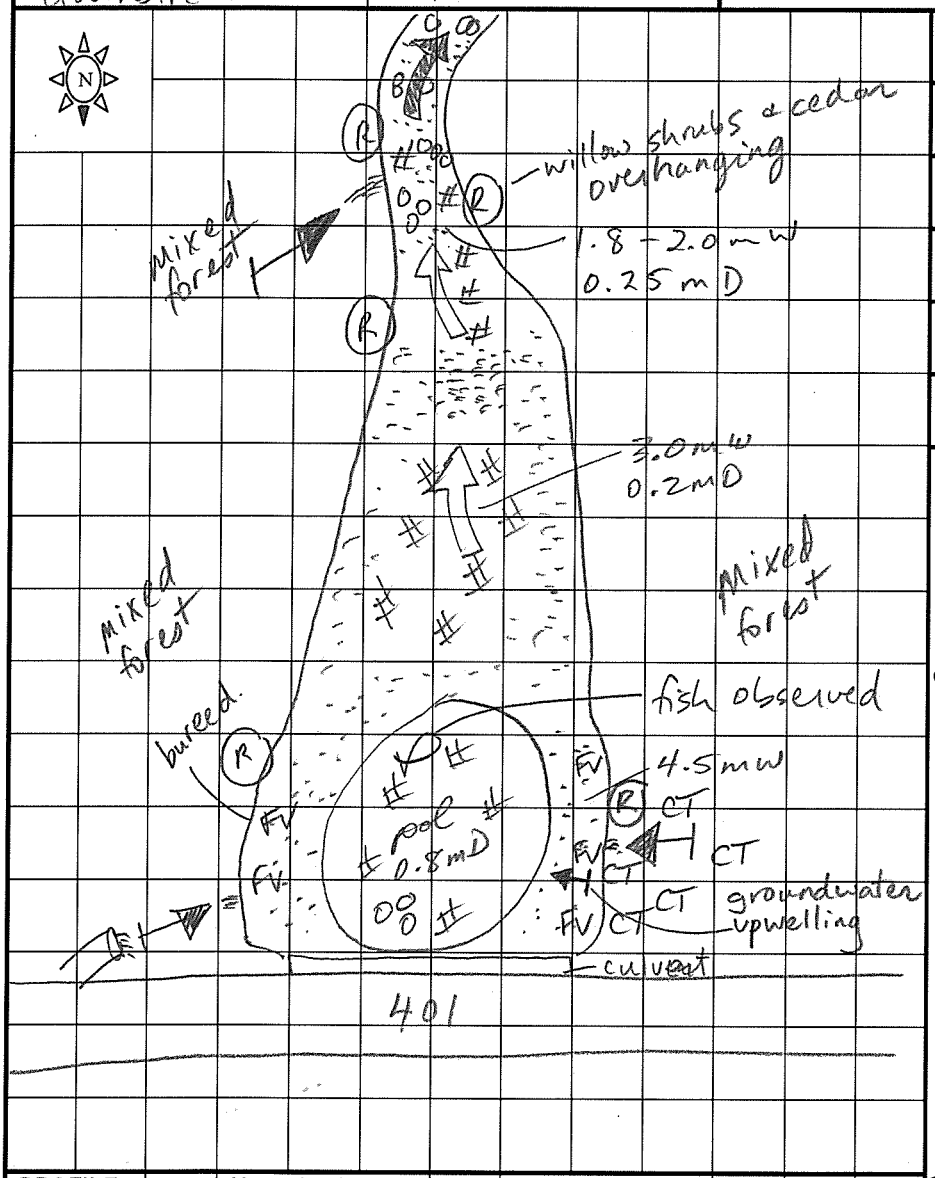
├► Seep/Spring
-------- Undercut Bank

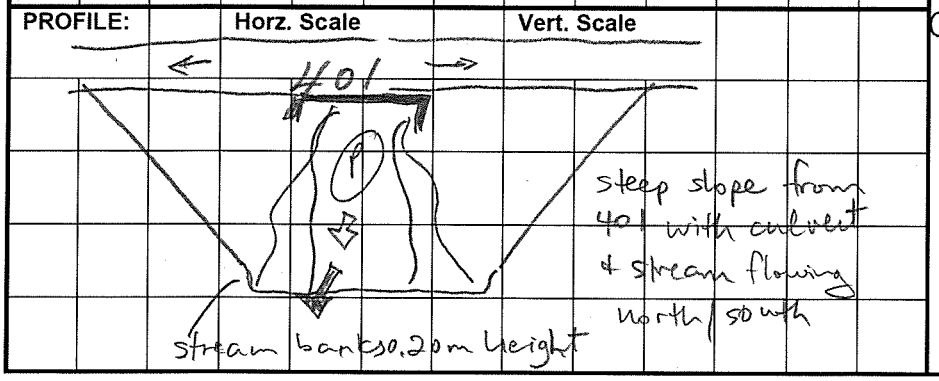
— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

Trib 2

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 2	20	1 / 1





PROJECT #: 165001057

MAPPER: MEllah

NAME OF WATERBODY: Trib 2

CROSSING #:

STATION #: Trib 2 - D/s.

DATE: DD-MMM-YY 07/06/17

LEGEND

- Fish
- **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

Watercourse Field Record Form — Trib 3

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
165001057	Hwy 401	7	June	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & MB	sunny & warm	10:20	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	10.9 DO: 11.3	508 pH 8.08

PHOTO NUMBERS AND DESCRIPTIONS: d/s: 716-742 u/s: 1003-1022

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
trib 3	L. ON.	—	Trib 3

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 735157E 4875780N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Forest	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m² 1.8

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/c + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s): mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other wetland inside
Percentage of area	~~30~~	20	40 / 50			40
Mean depth wetted (m)	5-10 cm	0.35-45	0.05 / 0.08 m			0.05
Mean width wetted (m)	1	2.2	2 / 0.9 m			2-5
Mean bankfull width (m)	~~4~~	~~5~~ 0	2 / 4.0			5
Mean bankfull depth(m)	>1	>1	0.4 / >1			0.3
Substrate	Cl Si Co	Cl Si Co	Bo Co / Co Gr Si			Co Bo Gr

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 3.

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☐	☐	☒
Right Upstream Bank	☐	☐	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	10	10	20	Instream / Overhanging 5		Instream / Overhanging 1	54

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☒	☐	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species				

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
			d/s perched 1.6m

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		Fe @ d/s culvert watercress u/s	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

u/s – wetland ~160m west drains through constructed drainage feature unlikely fish habs due to obstructions
- channelized feature 400m east along ROW w/ 1m wide @ 5cm deep over fine substrates
- total barrier to u/s movement due to riprap & flow drops

- remove perched culvert
- retain riparian trees

COMMENTS:

-u/s- small cattail wetland either side & constricted drainage u/l riprap
- dense watercress u/s @ culvert u/l riffle
- 40cm drop from constructed drainage 30cm wide through cattails unlikely fish hab
- Main drainage ROW east through 1m, 0.5m deep flow path
-d/s- perched culvert 1.6m, plunge pool ~0.4m riffle cascade 0.9 @ 8cm deep small plunge pool & end of 1st riffle, then shallow riffle over Co/Gr/Si to ROW
- flattens out to 1m run over C/Si/Co along steep eroding bank
- embankment collapsed @ culvert, very unstable
- gradient d/s to ROW fence

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 3

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
165001057	Hwy 401	13	June	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE & ME		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 3	
TOWNSHIP:	**MNR DISTRICT:** Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒ 30 Hz 200 V

Length (m):	Settings:	Seconds: 196 s.

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☐ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 3

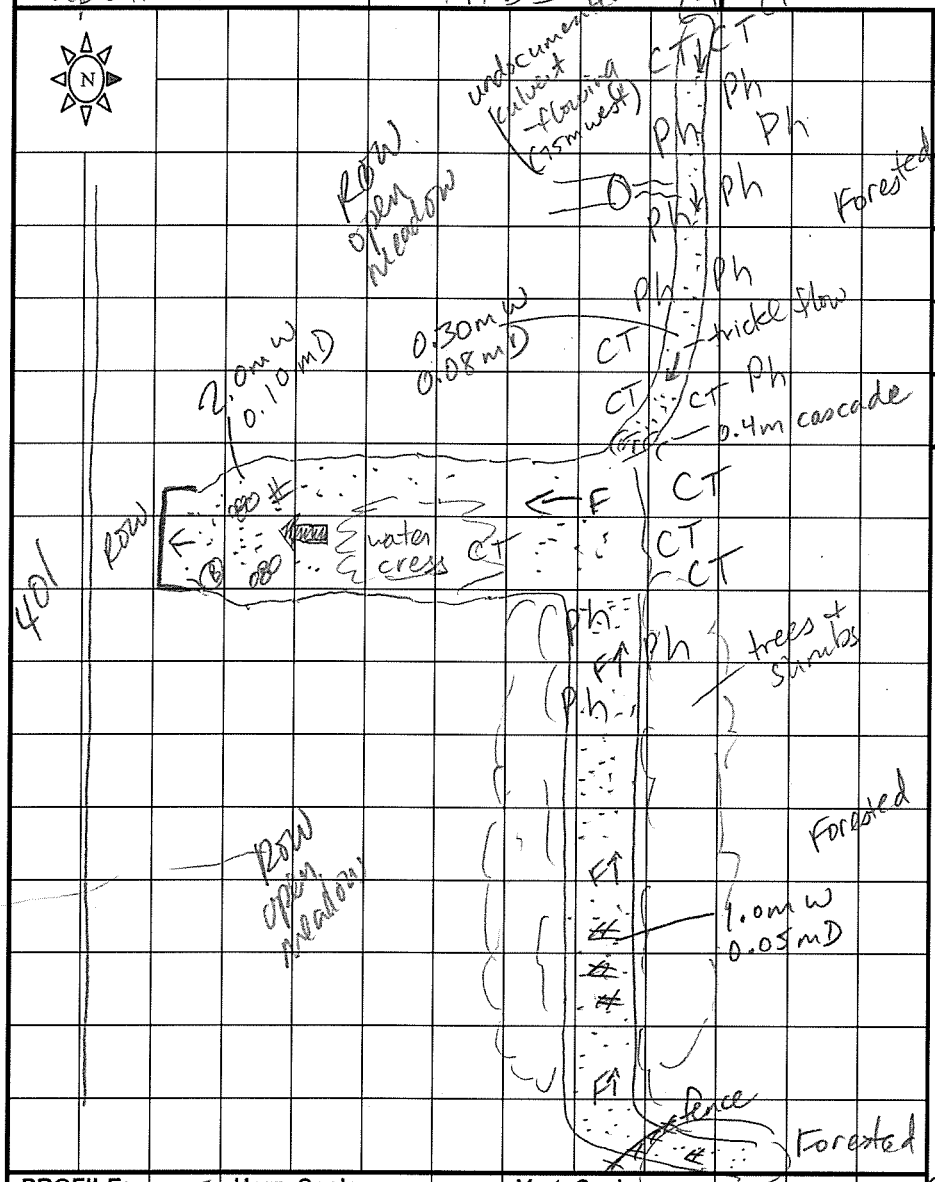
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
•	Fathead		spawning male		A
• •	Creek chubs				A
•	Brook stickleback				A

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 3

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Trib 3		1/1



PROJECT #: 16500157

MAPPER: MEllah

NAME OF WATERBODY: Trib 3

CROSSING #:

STATION #: Upstream

DATE: DD-MMM-YY 09-JUN-17

LEGEND

Ph - phragmites.

10d depth (cm)
6w width

F→ - flat

➡ 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

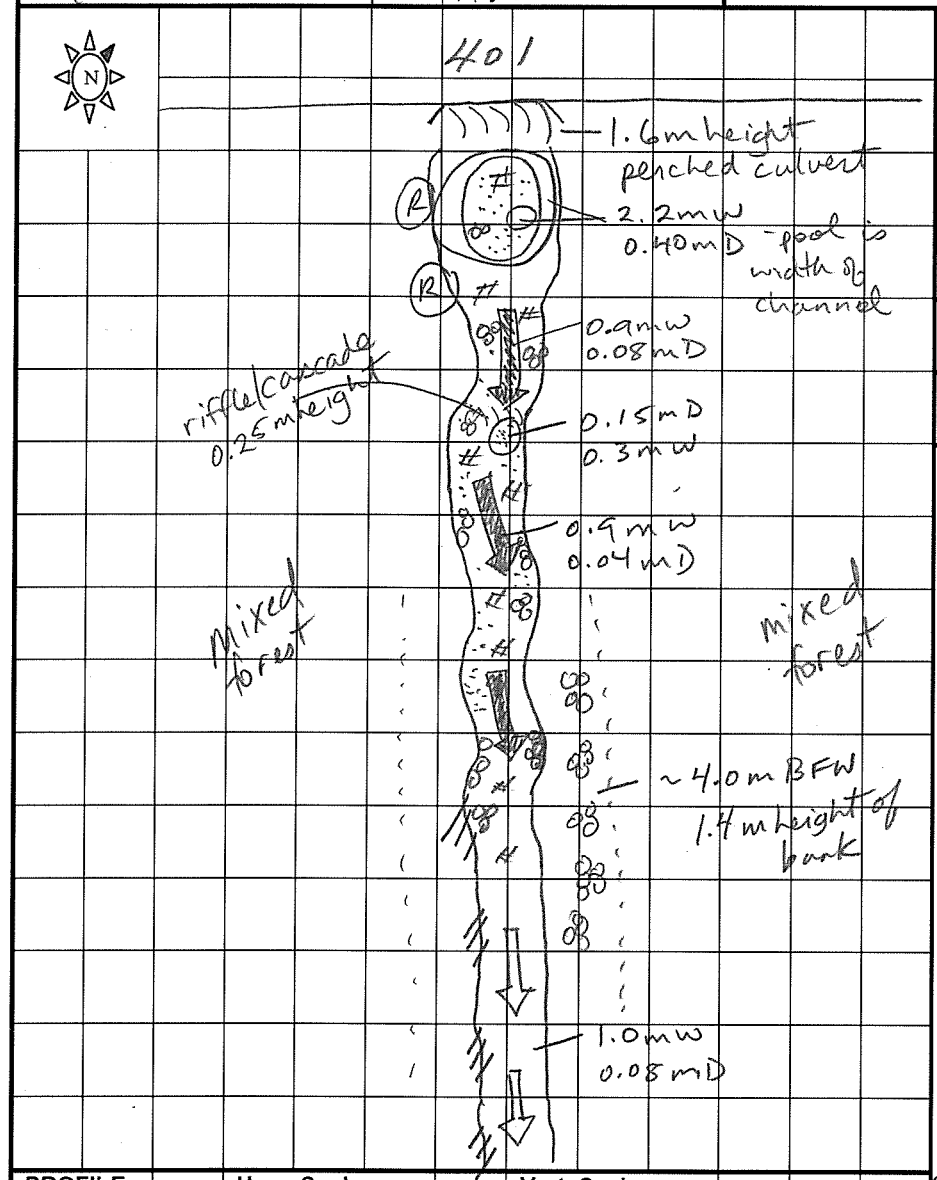
⊢➤ Seep/Spring
-------- Undercut Bank

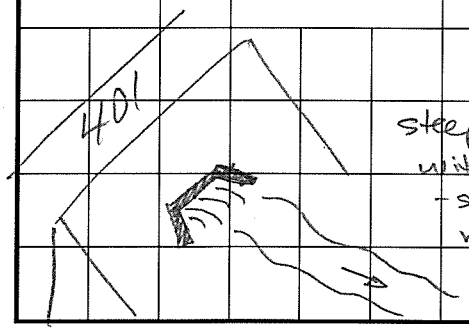
— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
⌴ Culvert

Trib 3

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib3	50	1/1





PROJECT #: 165001057

MAPPER: MEllah

NAME OF WATERBODY: Trib 3

CROSSING #:

STATION #: Trib 3

DATE: DD-MMM-YY 07/06/17

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

Watercourse Field Record Form — Trib 4

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16500105[illegible]	Hwy 401 Co	7	June	2017

Is STREAM REALIGNMENT required for this section:

☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + ME	sunny & warm	11 am	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (μS/cm):
	10.8 DO = 11.56	344 pH 8.35

PHOTO NUMBERS AND DESCRIPTIONS: (~~#s~~) 743-759 (~~#s~~)

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Trib 4	L. ON.	—	Trib ~~[illegible]~~ 4

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 736569E 4876090N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Forest	run-off

EXISTING STRUCTURE TYPE

Bridge ☐ | Box Culvert ☐ | Open Foot Culvert ☐ | CSP ☐ | N/A ☐

Other ☒ Describe: concrete arch — Size (w x h) m^2: 8m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m): 40 m u/s 50 m d/s — CURRENT VELOCITY (m/s): Mod

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert: run/☒cascade	Other: run/casc
Percentage of area	30 / 60	20 / 10	40 / 30		100	
Mean depth wetted (m)	0.4 / 0.2	0.7 / 0.5	0.1-0.2 / 0.2		10-20 cascade ~20cm	
Mean width wetted (m)	4 / 4	4 / 4	4 / 3-4		8m	
Mean bankfull width (m)	4.5 / 5-6	4.5 / 6-7	4.5 / 8		8m	
Mean bankfull depth (m)	0.8 / ~1m	~1m / ~1m	0.7 / ~1m		~1m	
Substrate	Sa Co / Sa Gr	Sa Gr Co / Sa Gr Bo	Bo Co Gr / Co Gr Bo		Gr Co	

Bedrock	Boulder	Cobble	Gravel	Sand	Silt	Clay	Muck	Detritus
Br	Bo	Co	Gr	Sa	Si	Cl	Mu	D

Watercourse Field Record Form

Trib 4

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☑	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	10	30	20	Instream / Overhanging 10	X	Instream / Overhanging X	30

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☑	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species				

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		low flow over flow dissipaters	

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	trout	embankment a seep d/s watercress u/s	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

- ↑ shade near culvert d/s.

COMMENTS:

- u/s - riffle over bo/co transitions to pool/run @ culvert
  pool ~0.7 m deep, run 0.4 m deep
  - widens @ culvert to 8m
  - watercress u/s bank
  - school fish observed in pool
- culvert - run/cascade over flow dissipaters, appear the middle cell doesn't connect
- riffle/pool/run over gr/sa/co ~4m wide & 20-50 cm deep

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

- beyond ROW is forested & riffle
- west embankment a large seep

Fish Community Inventory Record Form

Trib 4

GENERAL INFORMATION				
PROJECT #: 16500105?	PROJECT DESCRIPTION: Hwy 401	DAY: 13	MONTH: June	YEAR: 2017
COLLECTORS: KE & MH		TIME STARTED: 10:45	TIME FINISHED:	
WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable): Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION	
NAME OF WATERBODY: Unnamed Trib. 4	LOCATION OF STATION:
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒

Length (m): 40 m	Settings: 30Hz 170V	Seconds: 464 s

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☐ No	# OF BAGS	PRESERVATIVE: Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Tr.64

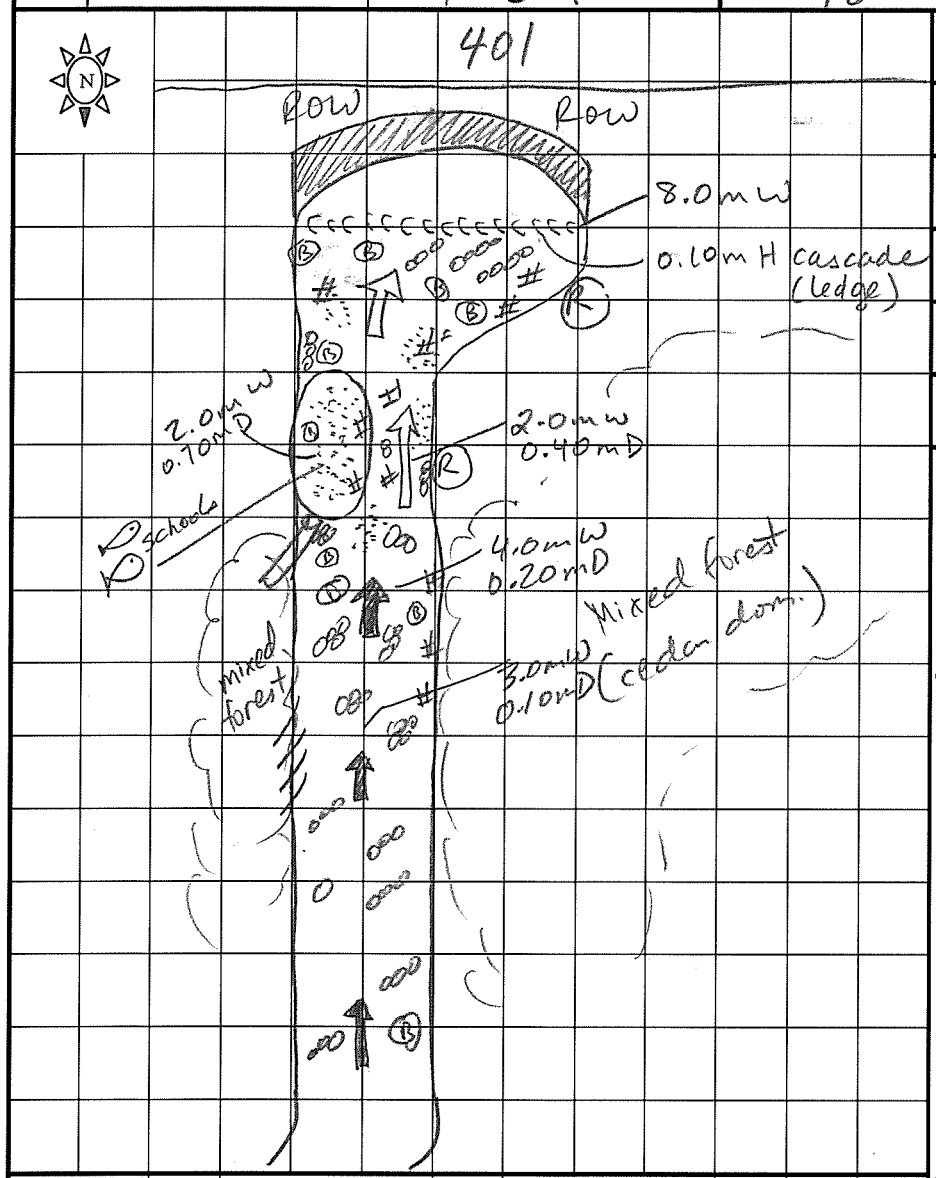
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
1	lamprey ammocete				
2	Rainbow Trout				A
3	Central Mudminnow				A
4	YOY Rainbow trout				YOY

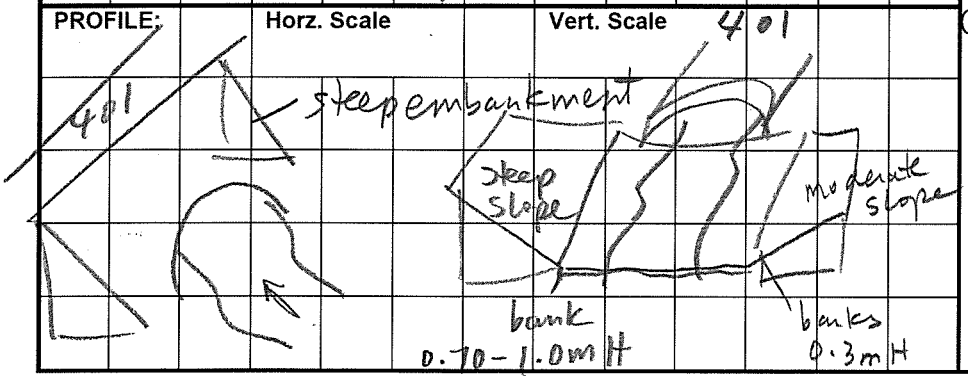
Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 4

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Upstream	Trib 4	40	1/2





PROJECT #:	165001057
MAPPER:	MEllah
NAME OF WATERBODY:	Trib 4
CROSSING #:	
STATION #:	upstream
DATE: DD-MMM-YY	09-JUN-17

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

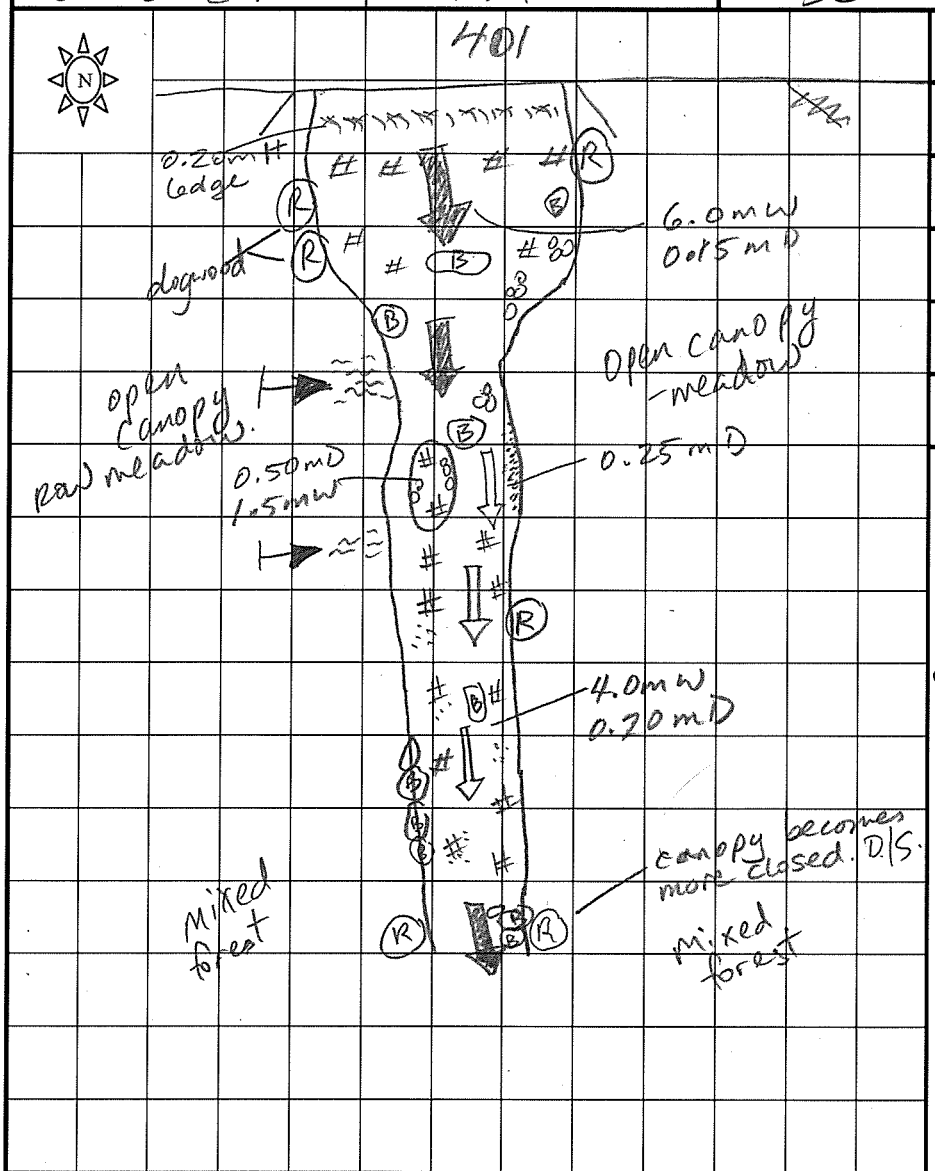
├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

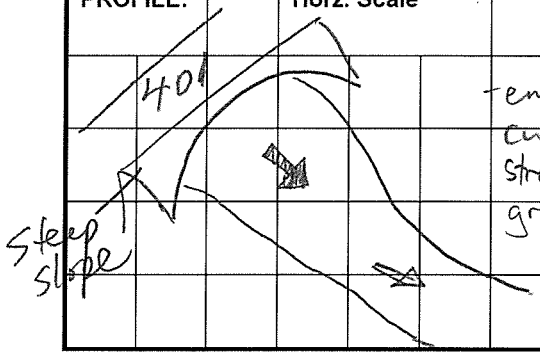
-x--x- Fence line
⊔ Culvert

Trib 4

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 4	30	1/2



PROFILE:	Horz. Scale	Vert. Scale



embankment with large culvert + medium sized stream. stream at moderate gradient.

PROJECT #:	165001057
MAPPER:	m Ellah
NAME OF WATERBODY:	Trib 4
CROSSING #:	
STATION #:	downstream
DATE: DD-MMM-YY	07-JUN-17

LEGEND

10d depth (cm)
6w width

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

▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** Debris (B)

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

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

XXX Riprap / Other Stabilization

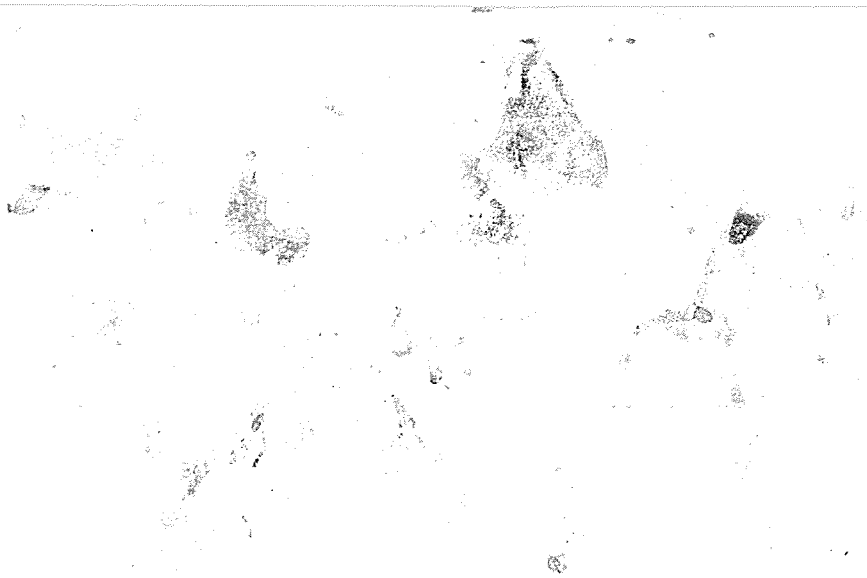
⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

⊢▶ Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert



Watercourse Field Record Form — Trib 6

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650001057	Hwy 401	7	June	2017

Is STREAM REALIGNMENT required for this section: ☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + ME	sunny + warm	1:30	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	11.6° DO = 10.61	381 pH 8.19

PHOTO NUMBERS AND DESCRIPTIONS: ~~(#5)~~ 760-789 ~~(#5)~~

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 6	L. ON.	—	Trib 6

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 739449 E 4876949 N	—
TOWNSHIP:	**MNR DISTRICT:**
—	Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Forest.	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2 3m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s): mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	100 / 50	25	25			
Mean depth wetted (m)	0.2 / 0.1	0.7m	0.15			
Mean width wetted (m)	1-3m / 1.8	3	1.85			
Mean bankfull width (m)	2-4 / 2	4	4			
Mean bankfull depth(m)	0.6 / 0.5	>1m	0-6			
Substrate	Sa S. Gr / Sa Si	Si Mu	Bo Co			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 6

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☐	☒	☐
Right Upstream Bank	☐	☐	☒	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	5	2	—	Instream 1 Overhanging 10	—	Instream 10 24 Overhanging	72 ~~80~~

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☒	☐	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
			2	98
Predominant Species			watercress, speedwell?	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	—	impediment woody jam @ fence	perched culvert 0.55 m d/s

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout	watercress u/s + d/s	—

POTENTIAL ENHANCEMENT OPPORTUNITIES:

d/s - retain root wads + woody debris
- limit tree removal

COMMENTS:

- u/s - run over hides, slumping bank u/s east side through watercress
- small vegetated island u/s of culvert
- constructed drainage from east side up embankment to trickle flow not fish hab, severe erosion in places.
- d/s - plunge pool / run / cascade / run / woody debris
- ~2m wide & 10 - 70 cm deep
- boulder cascade
- woody debris jam @ fence an impediment (1.5 + 40cm)
- sa/si substrate through most of reach u/s some boulder

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 6

GENERAL INFORMATION				
PROJECT #: 1105001057	PROJECT DESCRIPTION: Hwy 401	DAY: 14	MONTH: June	YEAR: 2017
COLLECTORS: KE & MS		TIME STARTED:		TIME FINISHED:
WEATHER CONDITIONS:		SURFACE CONDITIONS (if applicable): Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION	
NAME OF WATERBODY: unnamed Trib. 6	LOCATION OF STATION:
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY						
LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR		
ELECTROFISHER: ☒		
Length (m): 30 m q/s ROW	Settings: 30 Hz 150 V	Seconds: 211 s
NETS and TRAPS:		
MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify
HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
FISH KEPT? ☐ Yes ☒ No	# OF BAGS	PRESERVATIVE: Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:
Additional Notes Appended? ☐No ☐Yes number of pages _____

Fish Community Inventory Record Form

Trib 6

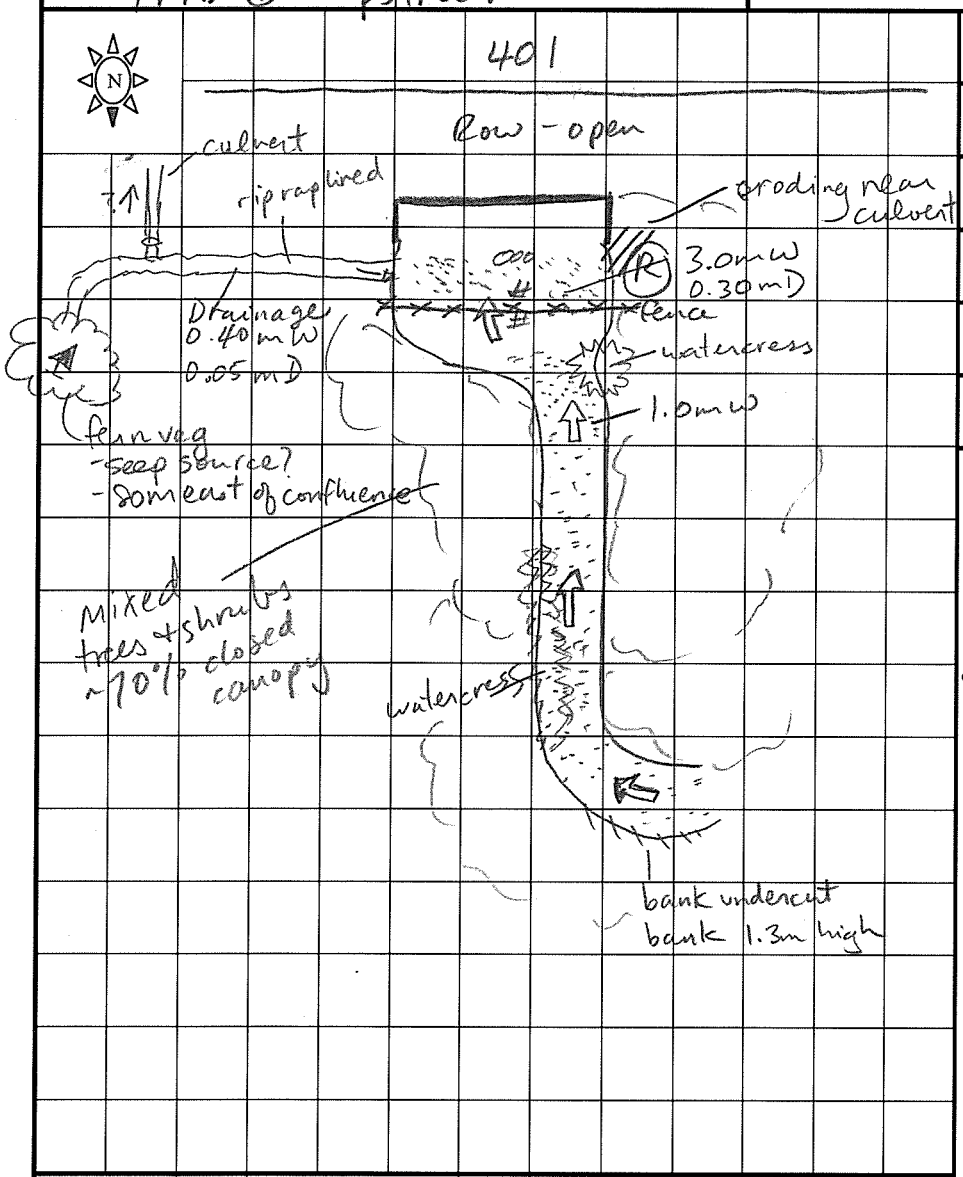
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
☒	Brook Trout				Adult
'	Brook Trout				Juv

Circle number if a sample was kept

PAGE 1 **of** 1 **Number all pages**

Trib 6

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Trib 6 - upstream		20	1 / 1

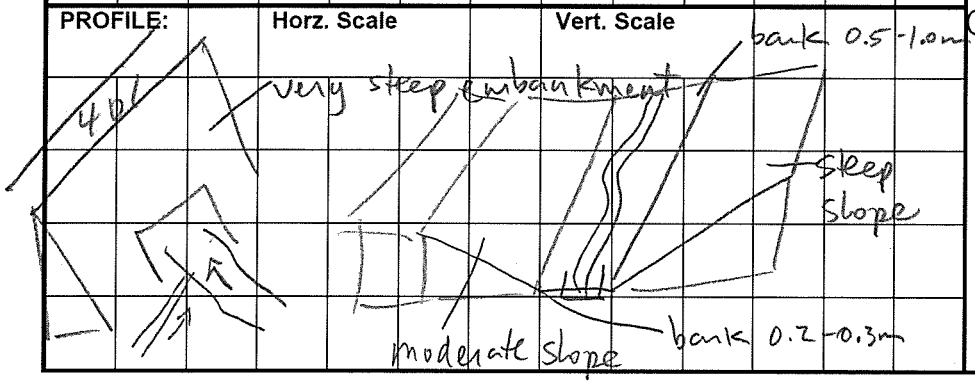


PROJECT #:	MAPPER:	NAME OF WATERBODY:	CROSSING #:	STATION #:	DATE: DD-MMM-YY
16500 1057	MEllah	Trib 6		upstream	09-JUN-17

LEGEND

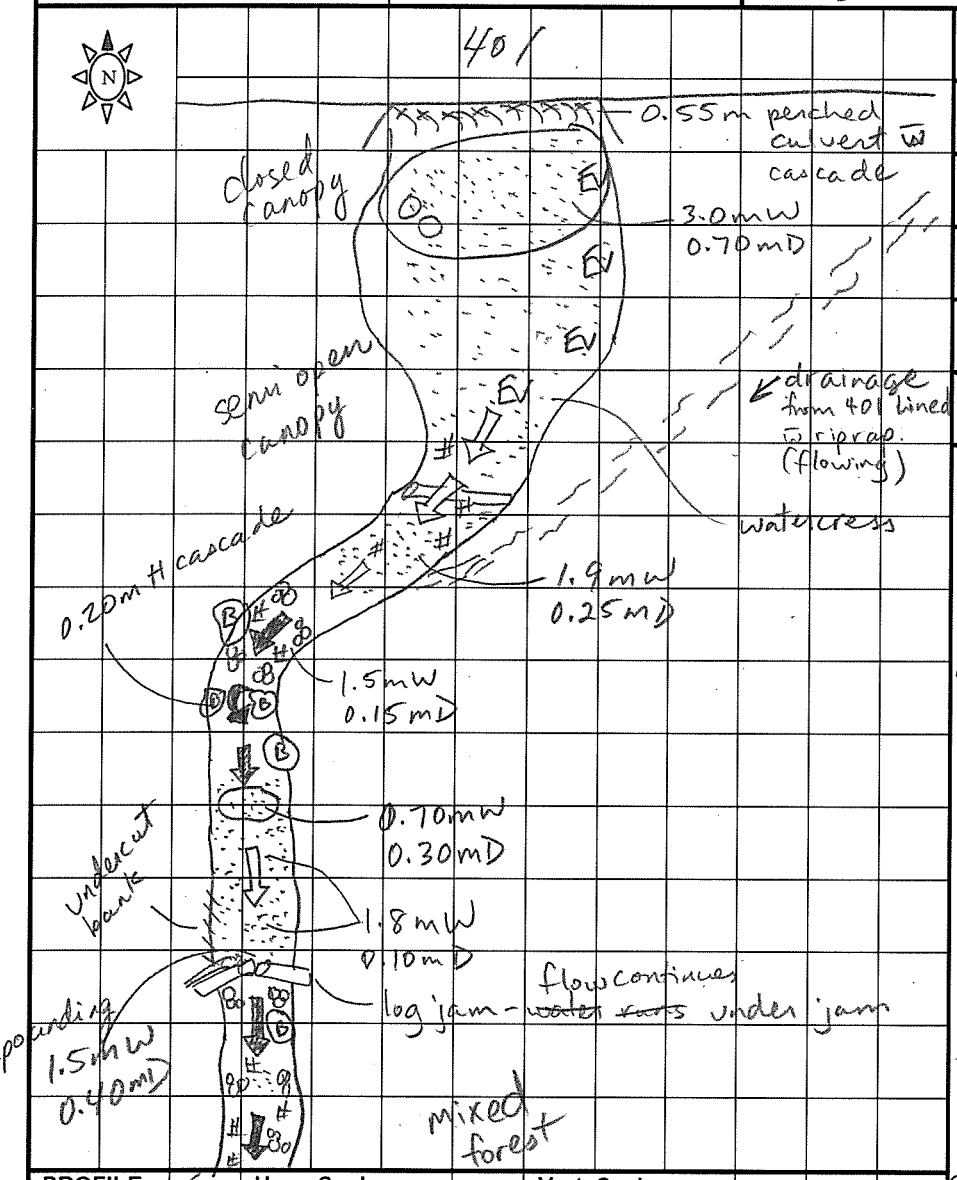
- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- **###** Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- **///////** 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**

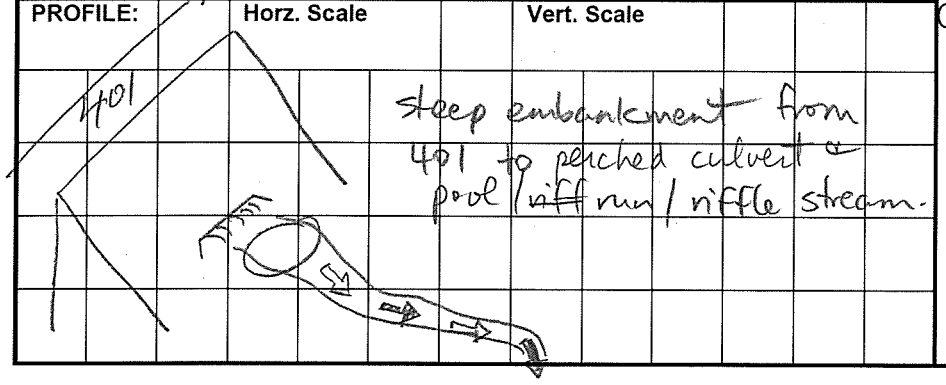


Trib 6

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 6	30	1/1



PROFILE: Horz. Scale: Vert. Scale



PROJECT #: 165001057

MAPPER: Ellah

NAME OF WATERBODY: Trib 6

CROSSING #:

STATION #: downstream

DATE: DD-MMM-YY: 07-JUN-17

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

Watercourse Field Record Form — Trib 7

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16500105	Hwy 401 Culvert	8	June	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & ME	sunny + warm	8:30	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	13.4° DO = 10.63	405 pH 7.52

PHOTO NUMBERS AND DESCRIPTIONS: ~~(#5)~~ 865-879 ~~(#5;)~~

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 7	L. ON.	—	Trib 7

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 261790 E 4877676 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
cedar forest	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☒	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m² 1.8 m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	CT d/s

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
30 d/s	mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐ riffle/run	Other
Percentage of area	40		60 / 100		100	
Mean depth wetted (m)	0.15		0.1 / 0.15		~10cm	
Mean width wetted (m)	0.7		0.7-1.6 / 1.2		1.8	
Mean bankfull width (m)	0.8-1.6		0.8-2 / ~2		1.8	
Mean bankfull depth(m)	0.3		~0.3 / ~0.6		~0.6	
Substrate	Co Gr		Gr Co Bo / Bo Bo Gr		Bo Co Gr	

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 7

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	X	5	30	Instream / Overhanging 20	X	Instream / Overhanging 5	40

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☒	☐	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species				

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout		

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - riffle/run sequence over co/Gr/Bo 0.6-1.6 m wide & 0.1 - 0.3 m deep. Under cedar trees.
  - CT wetland to west - seasonally floods into wetland
  - banks higher on east side, likely floods on west side during high flows

- d/s - 1.2m riffle over co/Bo/Gr. ~15cm deep flows into dense cedar forest beyond ROW
  - embankment drainage on west side, flowing over rip rap

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 87

GENERAL INFORMATION				
PROJECT #: 1050016057	PROJECT DESCRIPTION: Hwy 401	DAY: 14	MONTH: June	YEAR: 2017
COLLECTORS: KE & MG		TIME STARTED:		TIME FINISHED:
WEATHER CONDITIONS:		SURFACE CONDITIONS (if applicable):		
		Calm ☑	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION	
NAME OF WATERBODY: Unnamed Trib. 7	LOCATION OF STATION:
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒

Length (m): 60m 4's Kow	Settings: 30 Hz 150V	Seconds: 114 s

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☒ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐No ☐Yes number of pages _____

Fish Community Inventory Record Form

Trib 7

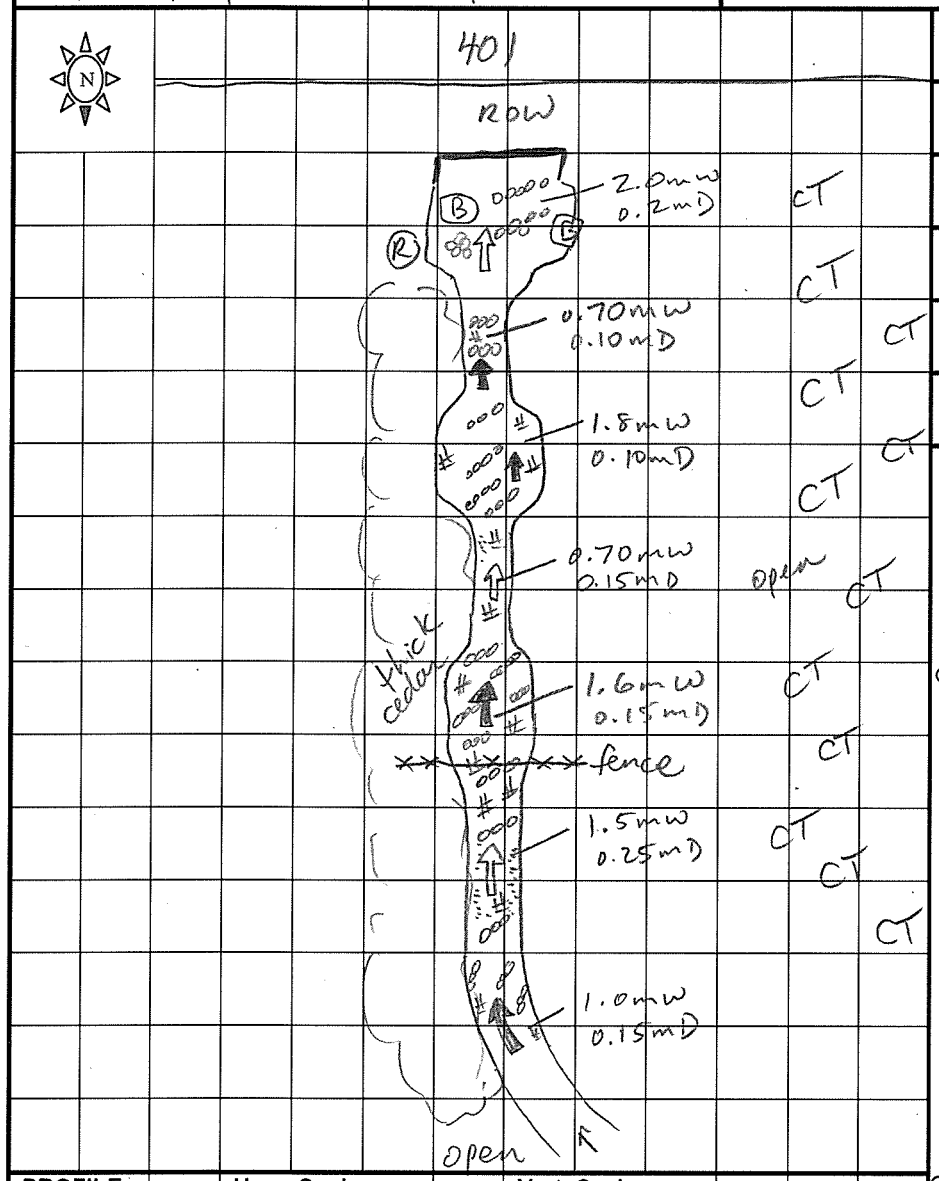
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
	No Catch				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 7

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Trib 7 upstream	upstream		1 | 1



PROJECT #:
165001057
MAPPER:
MEllah
NAME OF WATERBODY:
Trib 7
CROSSING #:
STATION #:
upstream
DATE: DD-MMM-YY
09-JUN-17

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

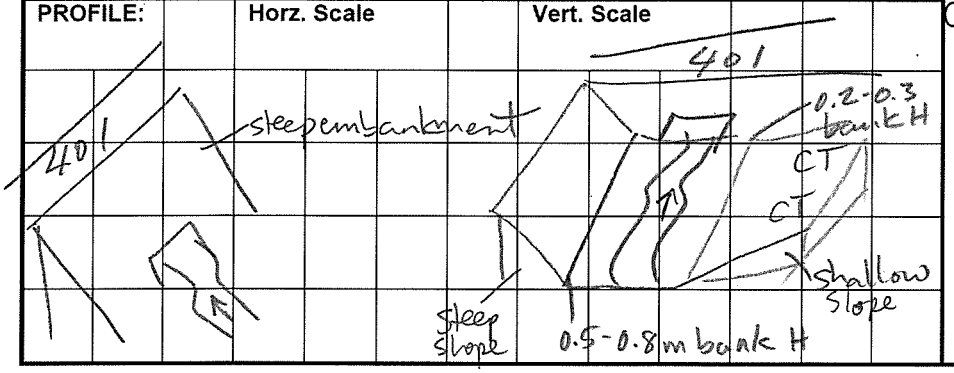
® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

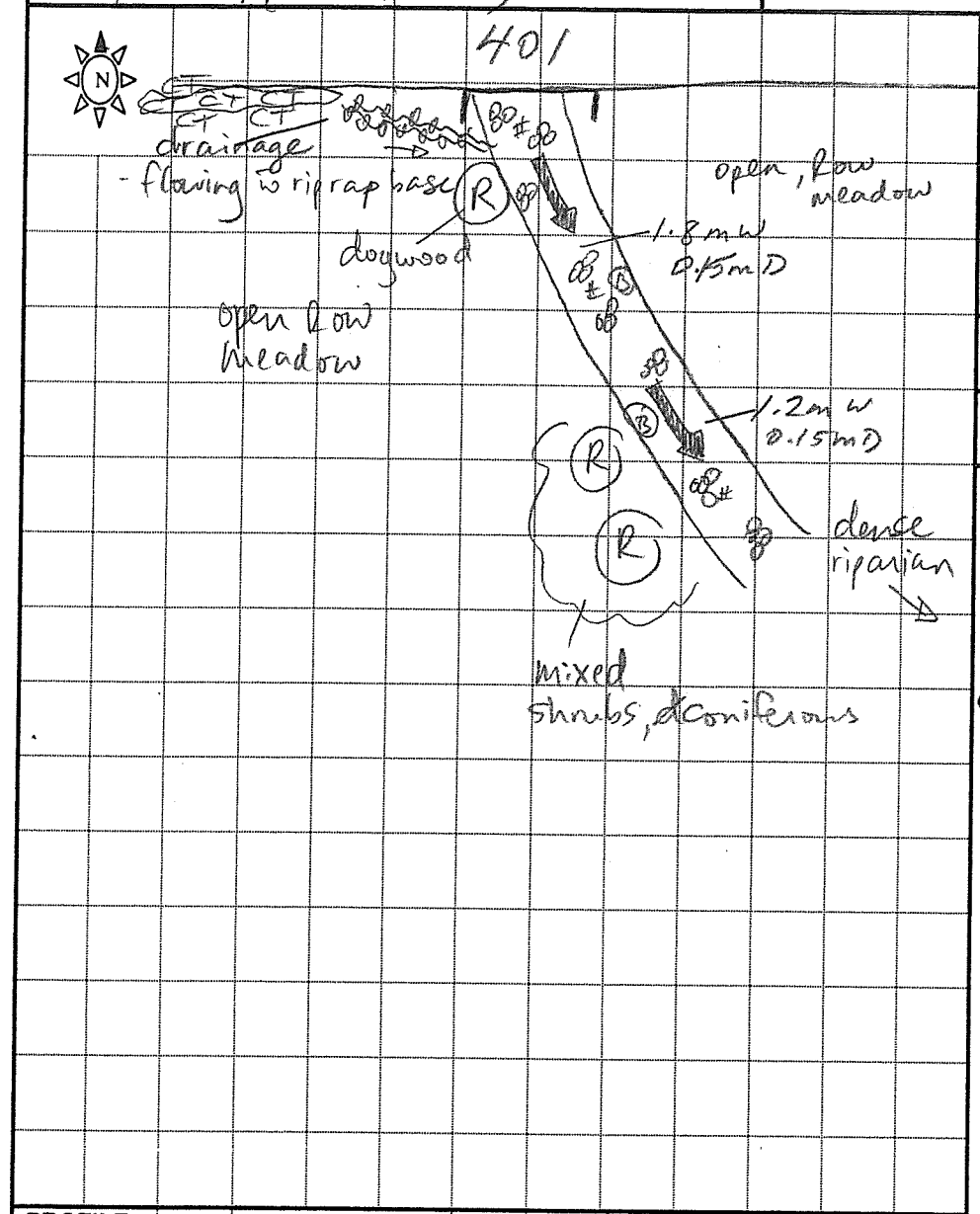
-x--x- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**



Trib 7

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Trib 7 (downstream)		20.0	1/1



PROJECT #:	MAPPER:	NAME OF WATERBODY:	CROSSING #:	STATION #:	DATE: DD-MMM-YY
165001057	MEllah	Trib 7		downstream	08-JUN-17

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

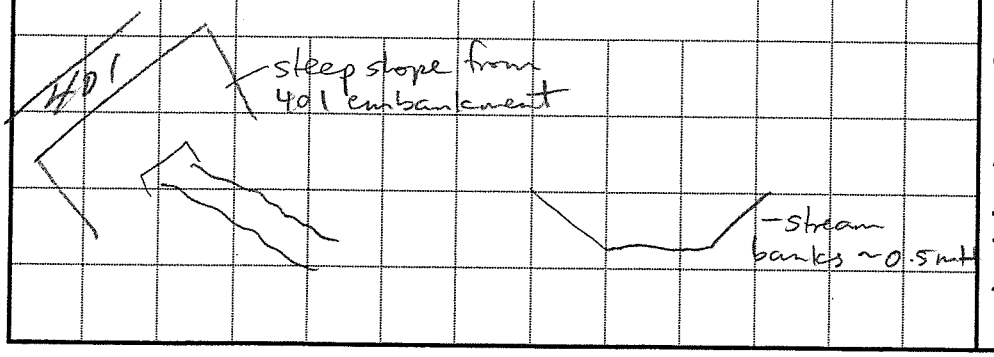
Ⓡ Riparian Tree

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

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
Culvert

PROFILE: **Horz. Scale** **Vert. Scale**



Watercourse Field Record Form

shelter Valley Creek

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650901057	Hwy 401 Cobourg	7	June	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & ME		2:40	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	13.3° DO= 10.86	360.9 pH 8.22

PHOTO NUMBERS AND DESCRIPTIONS: 790 - 843

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
shelter Valley Creek	L. ON.	—	shelter valley

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 260560 E 4877535 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Forest	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☒ Describe: concrete Arch Size (w x h) m² 15m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s.	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
60 u/s 100m d/s	Fast

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	60 / 30		40 / 70			
Mean depth wetted (m)	0.5-0.6 / 0.4-0.6		0.3 / 0.2			
Mean width wetted (m)	6-8 / 6-8		8 / 6			
Mean bankfull width (m)	10 / 10+		10 / 10+			
Mean bankfull depth(m)	1m / 1m		1m / 1m			
Substrate	Co 80 Sa Co Gr /		Bo Co / 10 Gr Bo			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Shelter Valley

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☐	☐	☒
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	5	20	30	Instream / Overhanging	–	Instream / Overhanging 5	40

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species				

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout YES captured	watercress	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

- ↑ riparian cover

COMMENTS:

- u/s - riffle/run over Bo/Co/Gr.
  - riffle 7-8 m & 20-30 cm
  - run 6-7 m & 50-60 cm

- d/s - large riffle & run over Co/Gr/Bo & Sa
  - 6-8 m wide
  - 20-60 cm deep

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Shelter Valley Creek

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16500105 7	Hwy 401	07	06	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
MEllah, K Easterling	15:00	16:00

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm	Rippled	Wavy	Rough
clear, ~21°C	O	(O)	O	O

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
Shelter Valley Creek	downstream of 401 Hwy
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream	✓	22	8.22	10.86	13.3	360.9
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ✓	Yellow/brown O	Blue/green O	Turbid O	Other O

GEAR

ELECTROFISHER: ✓

Length (m): 30	Settings: 200V, 30 Hz	Seconds: 604

NETS and TRAPS:

MINNOW TRAP: O #	DIP NET O	TRAP NET O
SEINE: O	GILL O	OTHER O specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT?	# OF BAGS	PRESERVATIVE:			
O Yes O (No)		Formalin O	Frozen O	Alcohol O	Other O

COMMENTS:

Additional Notes Appended? o No o Yes number of pages _____

Fish Community Inventory Record Form

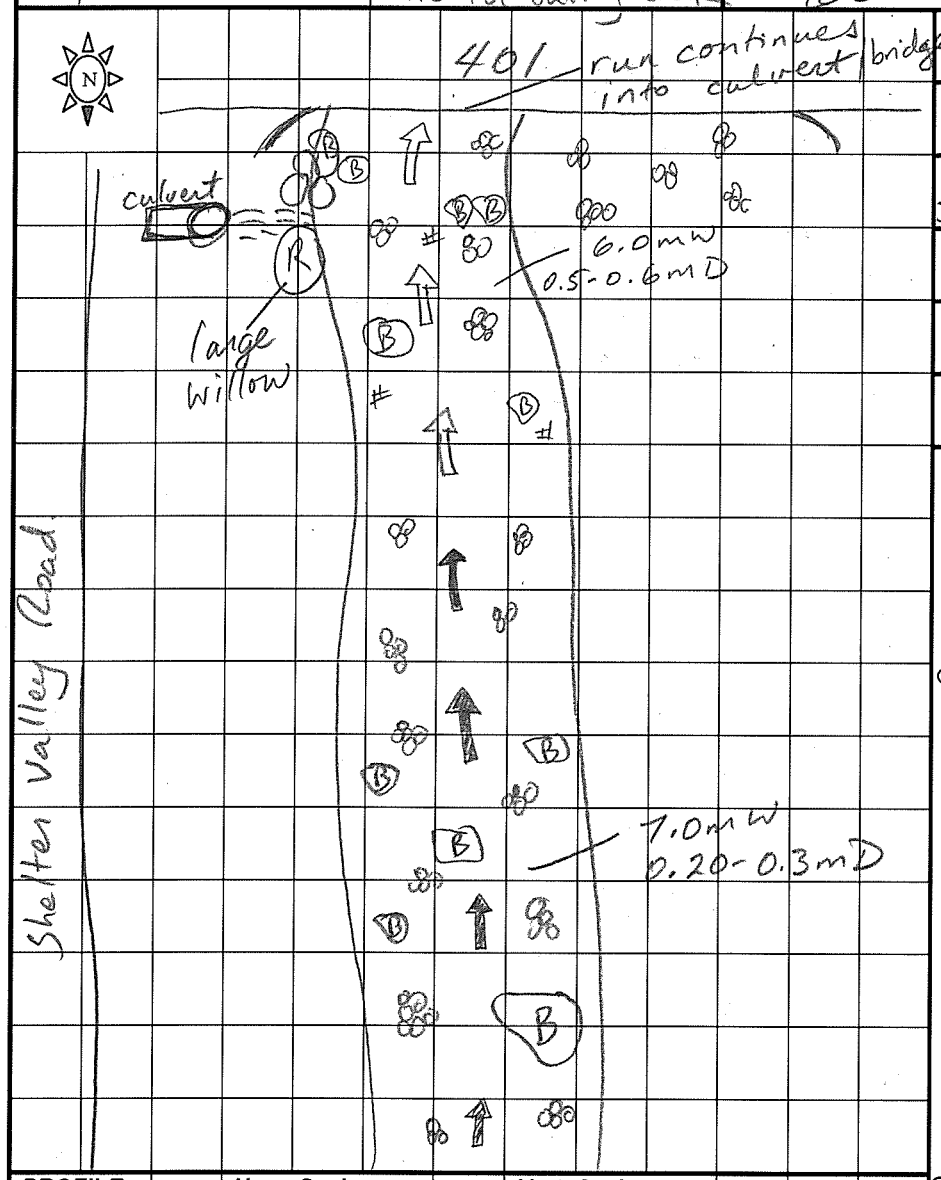
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:** Shelter Valley Creek			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
(2)	Rainbow Trout	✓	✓	✓	✓
(6)	Mottled Sculpin	✓	✓	✓	✓
(1)	yoy salmonid	✓	✓	✓	✓

Circle number if a sample was kept

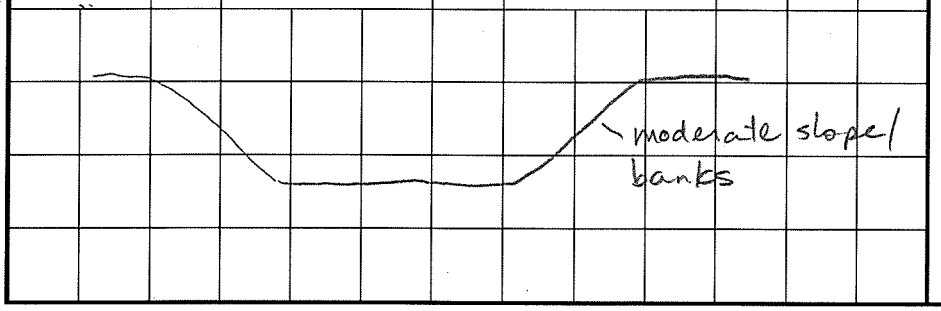
PAGE _____ of _____ **Number all pages**

shelter valley

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Shelter Valley Creek	60	1 = ~~0.5~~ 2.0



PROFILE: Horz. Scale Vert. Scale



PROJECT #: 165001057

MAPPER: MEllah

NAME OF WATERBODY: Shelter Valley Creek

CROSSING #:

STATION #: upstream

DATE: DD-MMM-YY 07-JUN-17

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

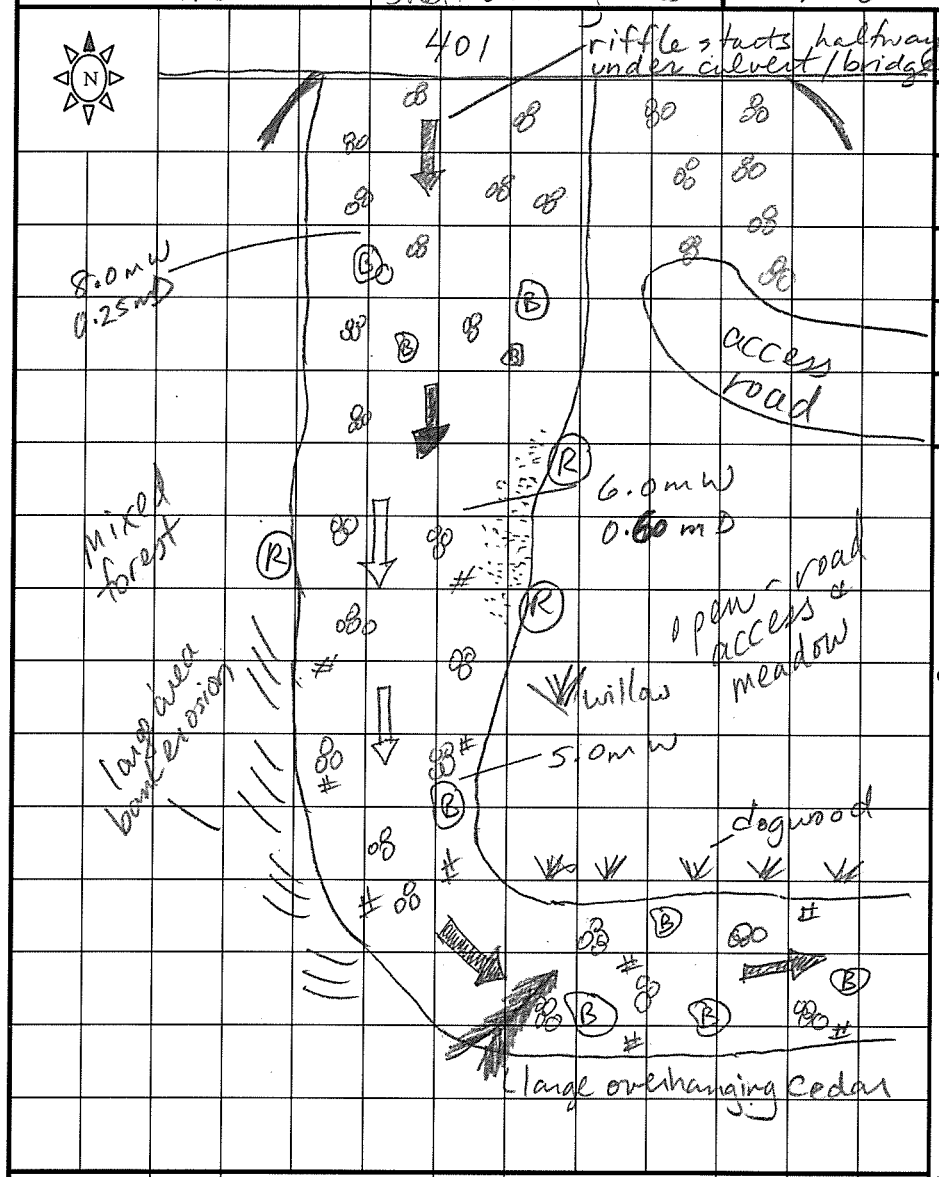
├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

Shelter Valley

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Shelter Valley Creek	100	1/~~0.5~~2.0



PROJECT #:	165001057
MAPPER:	M Ellah
NAME OF WATERBODY:	Shelter Valley Creek
CROSSING #:	
STATION #:	downstream
DATE: DD-MMM-YY	07-JUN-17

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

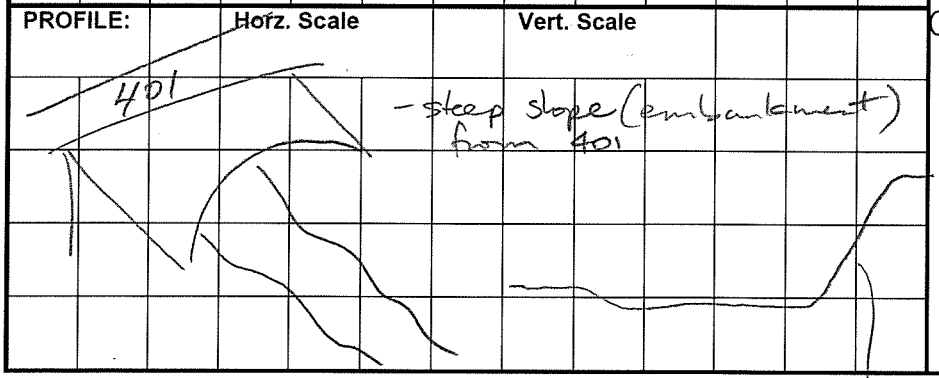
® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-X--X- Fence line
└┘ Culvert

PROFILE: Horz. Scale Vert. Scale



erosion of bank on west side of creek ~15m high banks.

Watercourse Field Record Form — Trib 8

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16600105	Hwy 401	7	June	2017

Is STREAM REALIGNMENT required for this section: ☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & ME	sunny & warm	4:45 pm	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	18° DO = 7.87	410 pH 8.01

PHOTO NUMBERS AND DESCRIPTIONS: 844 - 864

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib 8	L. ON.	—	Trib 8

LOCATION OF CROSSING: Vernonville Road @ 401

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 262074 E 4877712 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
rural	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☒	N/A ☐

Other ☐ Describe: — Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s.	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☐	☒	☐	

TOTAL SECTION LENGTH (m): 50 m u/s 100 d/s. CURRENT VELOCITY (m/s): mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	~~100~~ 45	20 / 5		80 / 50		
Mean depth wetted (m)	~~dry~~ 0.09-15	0.25 / 0.45		1-2cm / 1-2cm		
Mean width wetted (m)	~~dry~~ 0.4-1	1 / 1.8		1.8-2 / 1.8-2		
Mean bankfull width (m)	2 / 1.5	1.5 / 2		2.2 / 2.2		
Mean bankfull depth(m)	~~dry~~ 0.6	0.6 / 0.8		0.6 / 0.2		
Substrate	~~Sa Gr~~ Gr Si	Co Gr Sa / Si Gr Sa		Si Mu / Si Mu		

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 8

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
				Instream		Instream 90	5
				Overhanging		Overhanging 5	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☐	☒	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species		algae	grasses CT	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		low flow	

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s- main source of flow east side of Veronnilee Rd, north of Rutherford rd, not as mapped
  - pool mostly flat 1.8 m x 1-2cm deep into catch basin
  - cobble in pool
- d/s- pool @ culvert 45cm x 1.8, run in ramoved channel 0.4 - 1.1 m x 0.9-0.15m deep
  - flat through dense grassy veg, 1-2cm deep x 1.8 m wide

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form Trib 8

GENERAL INFORMATION				
PROJECT #: 1050010S7	PROJECT DESCRIPTION: Hwy 401	DAY: 08	MONTH: JUN	YEAR: 2017
COLLECTORS: mEllah, kEasterling		TIME STARTED: 11:38	TIME FINISHED:	
WEATHER CONDITIONS: clear, 22°C no precip last 24 hours		SURFACE CONDITIONS (if applicable):		
		Calm (O)	Rippled O	Wavy O	Rough O

GENERAL LOCATION	
NAME OF WATERBODY: Trib 8	LOCATION OF STATION: see comments below
TOWNSHIP:	MNR DISTRICT: Peterborough

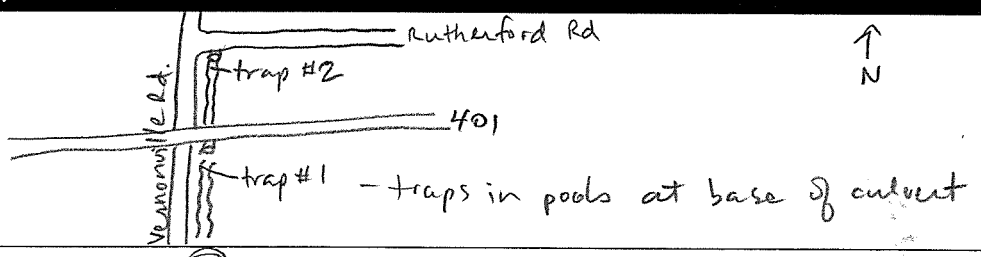
SAMPLING LOCATIONS AND WATER CHEMISTRY						
LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream	see habitat assessment form - 07-JUN-2017					
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless O	Yellow/brown (O)	Blue/green O	Turbid O	Other O

GEAR		
ELECTROFISHER: O		
Length (m):	Settings:	Seconds:
NETS and TRAPS:		
MINNOW TRAP: (O) # 2	DIP NET O	TRAP NET O
SEINE: O	GILL O	OTHER O specify
HAULS (#):	Period Of Time (24 hour clock):	
	Set 08-JUN-2017 Time 11:38	Clear June 9 2017 time 8:30am
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
FISH KEPT? O Yes (O) No	# OF BAGS	PRESERVATIVE:			
		Formalin O	Frozen O	Alcohol O	Other O

COMMENTS:



Additional Notes Appended? o No o Yes number of pages _____

Fish Community Inventory Record Form

Trib 8

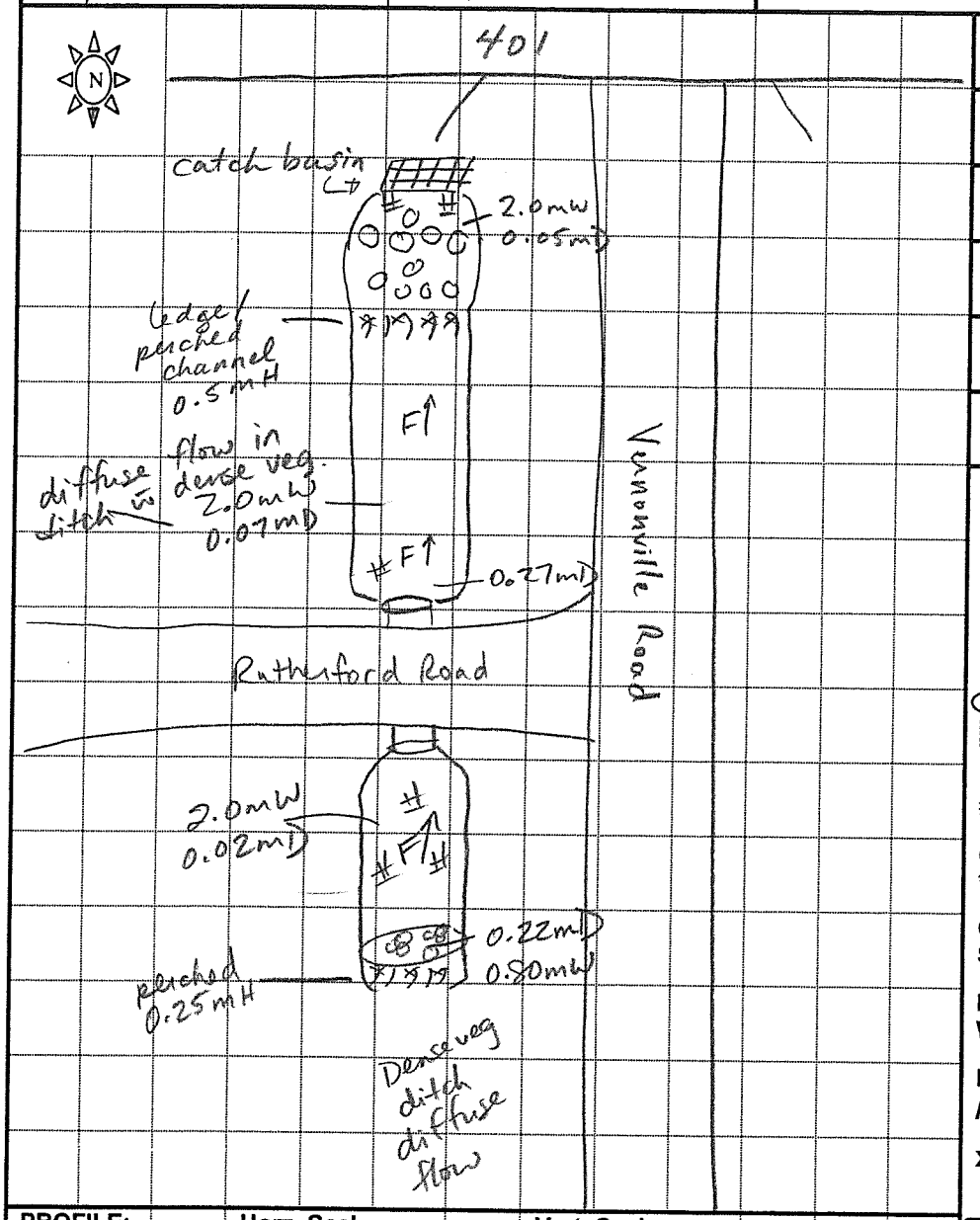
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
	No Catch				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

trib 8

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Trib 8	50	1/1

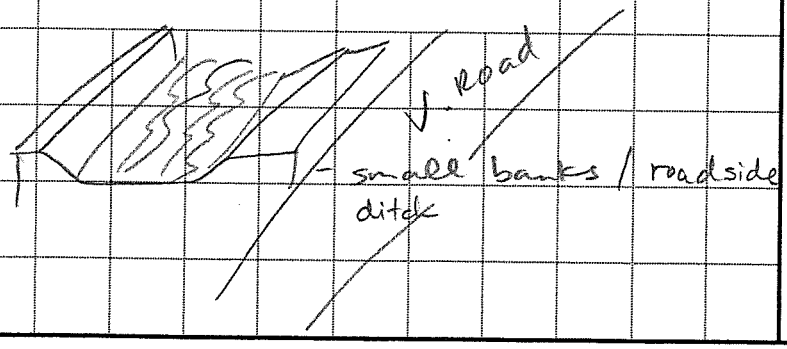


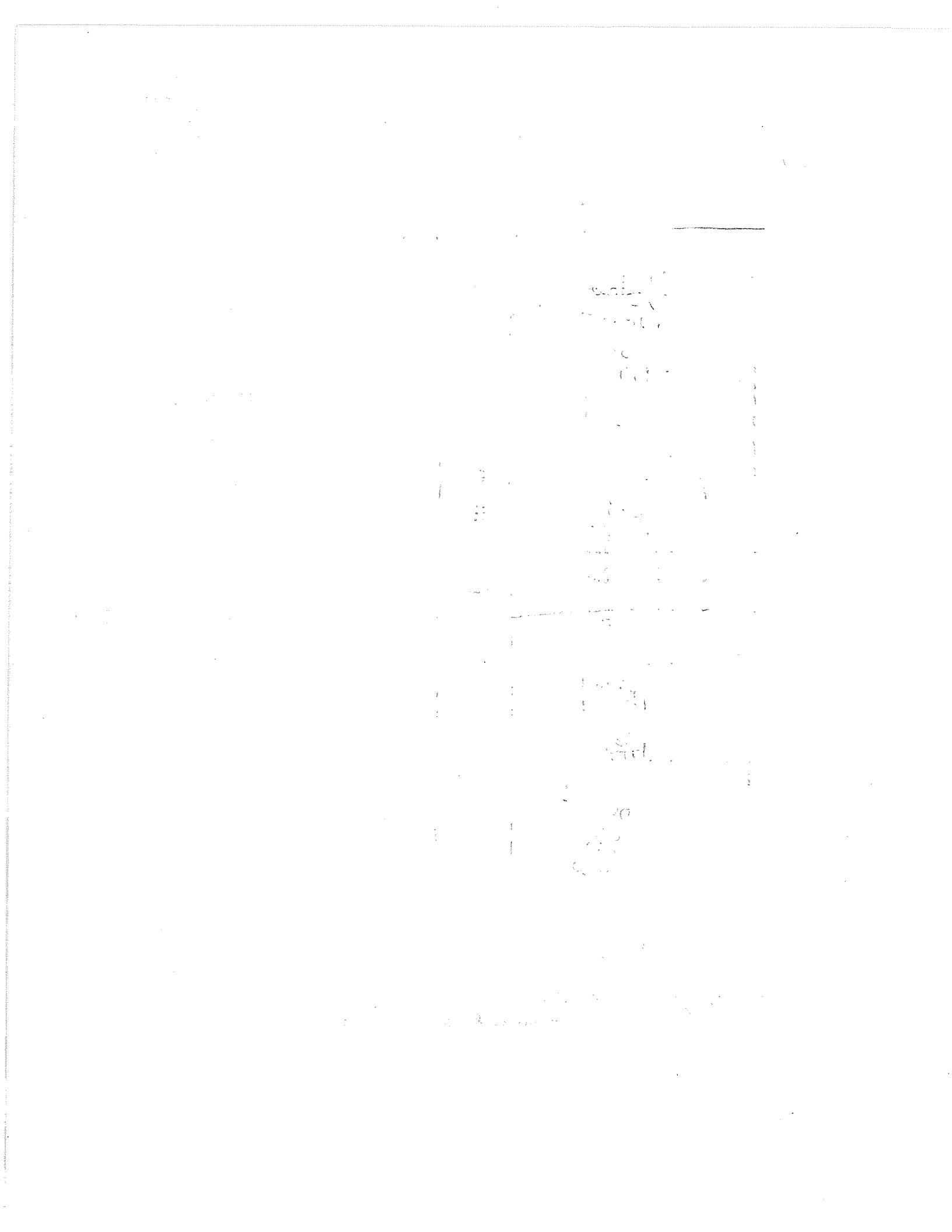
PROJECT #:	165001057
MAPPER:	MEllah
NAME OF WATERBODY:	Trib 8
CROSSING #:	
STATION #:	upstream
DATE: DD-MMM-YY	07-JUN-17

LEGEND

- F → flat
- **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

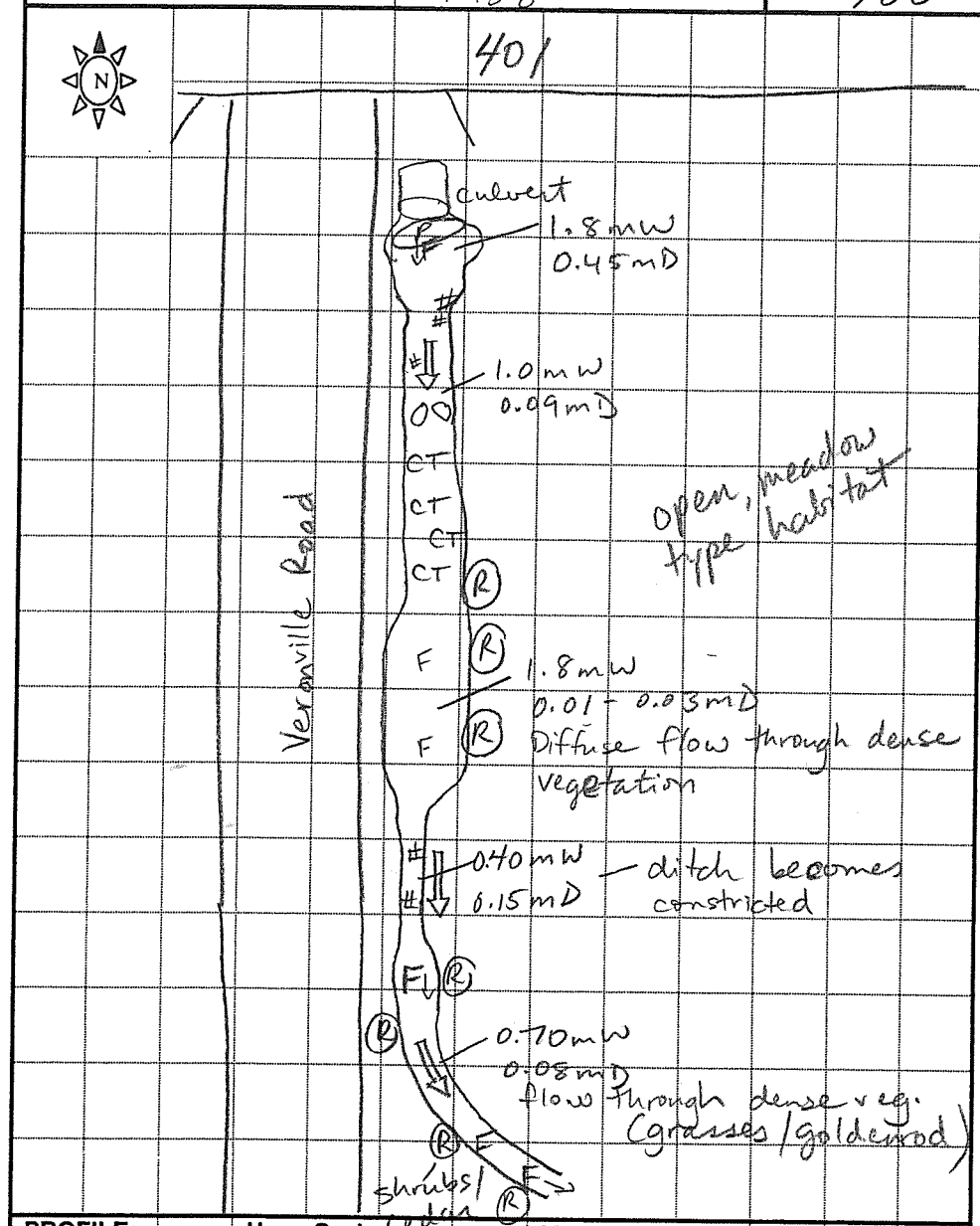
PROFILE: **Horz. Scale** **Vert. Scale**



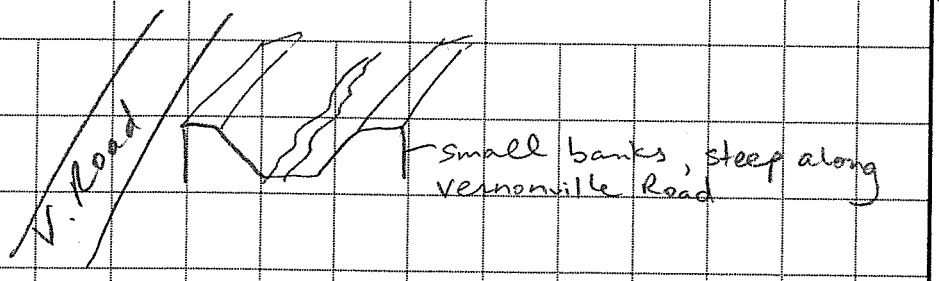


Trib 8

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 8	100	1/1



PROFILE: Horz. Scale Vert. Scale



PROJECT #: 165001057

MAPPER: MEllah

NAME OF WATERBODY: Trib 8

CROSSING #:

STATION #: downstream

DATE: DD-MMM-YY 07-JUN-17

LEGEND

F - Float
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

Watercourse Field Record Form — Trib 9

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16500657	Hwy 401 Colours	8	June	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & ME	sunny & warm	9:00	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	12.3° DO = 13.03	329 pH 8.11

PHOTO NUMBERS AND DESCRIPTIONS: ~~#~~ 880-890 ~~#~~

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Unnamed Trib. 9	L. ON.	—	Trib 9

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 263320 E 4877873 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
AS	run-off, livestock waste

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: | Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
50 d/s	mod

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	70	3	97 30			
Mean depth wetted (m)	0.25 5	0.9	0.25 5-6			
Mean width wetted (m)	3.5 100	4	3 ~15			
Mean bankfull width (m)	4. 6	5.	4 6			
Mean bankfull depth(m)	0.8 >1m	>1m	0.80 0.5			
Substrate	Bo Sa Sa Bo	Sa Gr	Co Bo Sa Gr Co			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 9

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☑	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	1	10	10	Instream Overhanging 10		Instream Overhanging 1	48

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☑ u/s	☐	☐	☑ d/s	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species				100

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	–	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	trout in riffle d/s run?	/	/

POTENTIAL ENHANCEMENT OPPORTUNITIES:

- ↑ riparian shade in row u/s

COMMENTS:

- u/s - run/riffle/pool over co/gr/sa ~3m wide & 0.25 deep through cedar forest
  - side trib 0.6m & 0.1m deep u/s 0.3m plunge to creek ~3m from culvert

- d/s - wide, deep run over sa/BO, beyond bridge, channel narrows & riffle forms over CO/Gr around bend, then transitions to run

- large fish in run @ culvert

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

* possible trout observed d/s pool.

Fish Community Inventory Record Form

Trib 9

GENERAL INFORMATION				
PROJECT #: 165001057	PROJECT DESCRIPTION: Hwy 401 Cobourg	DAY: 14	MONTH: June	YEAR: 2017
COLLECTORS: KE & ME		TIME STARTED:	TIME FINISHED:	
WEATHER CONDITIONS:		SURFACE CONDITIONS (if applicable):		
		Calm ☒	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION	
NAME OF WATERBODY: unnamed Trib. 9	LOCATION OF STATION:
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY						
LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream	5m					
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR		
ELECTROFISHER: ☒		
Length (m): 5m d/s	Settings: 30Hz 150V	Seconds: 183
NETS and TRAPS:		
MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify
HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
FISH KEPT? ☐ Yes ☐ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:
Additional Notes Appended? ☐No ☐Yes number of pages _____

Fish Community Inventory Record Form

Trib 9

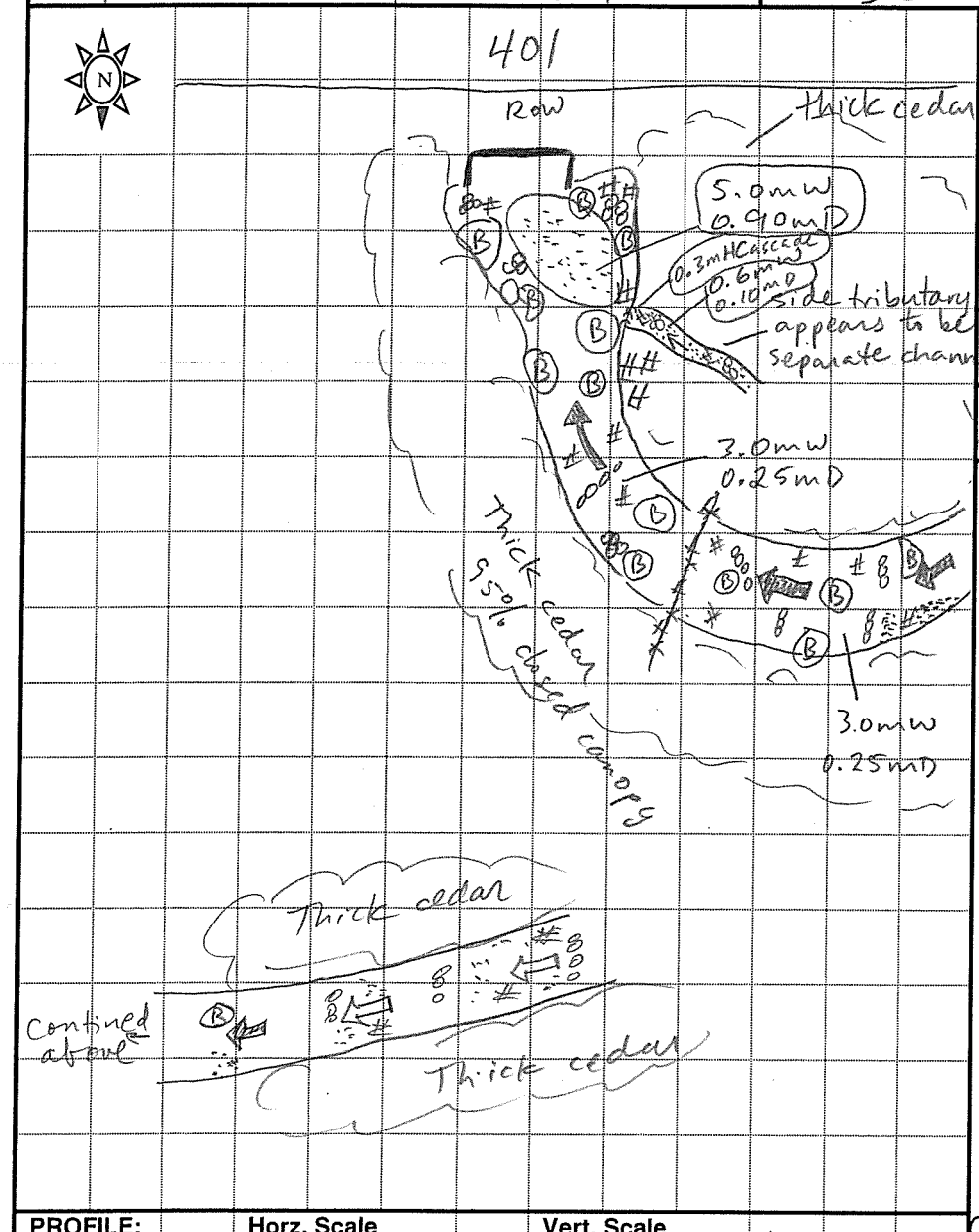
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
17	White Sucker				
2	Creek chub				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 9

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Trib 9	50	1/2



PROJECT #: 16500105?

MAPPER: McLeah

NAME OF WATERBODY: Trib 9

CROSSING #:

STATION #: upstream

DATE: DD-MMM-YY 09 - JUN - 17

LEGEND

—continued below

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

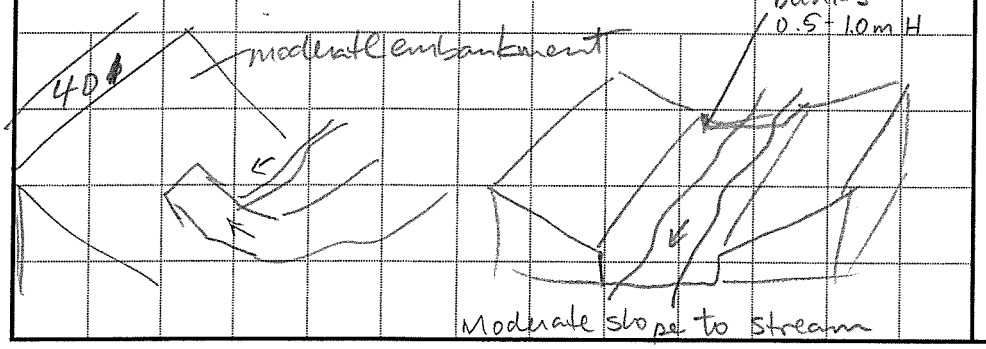
Ⓡ Riparian Tree

├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

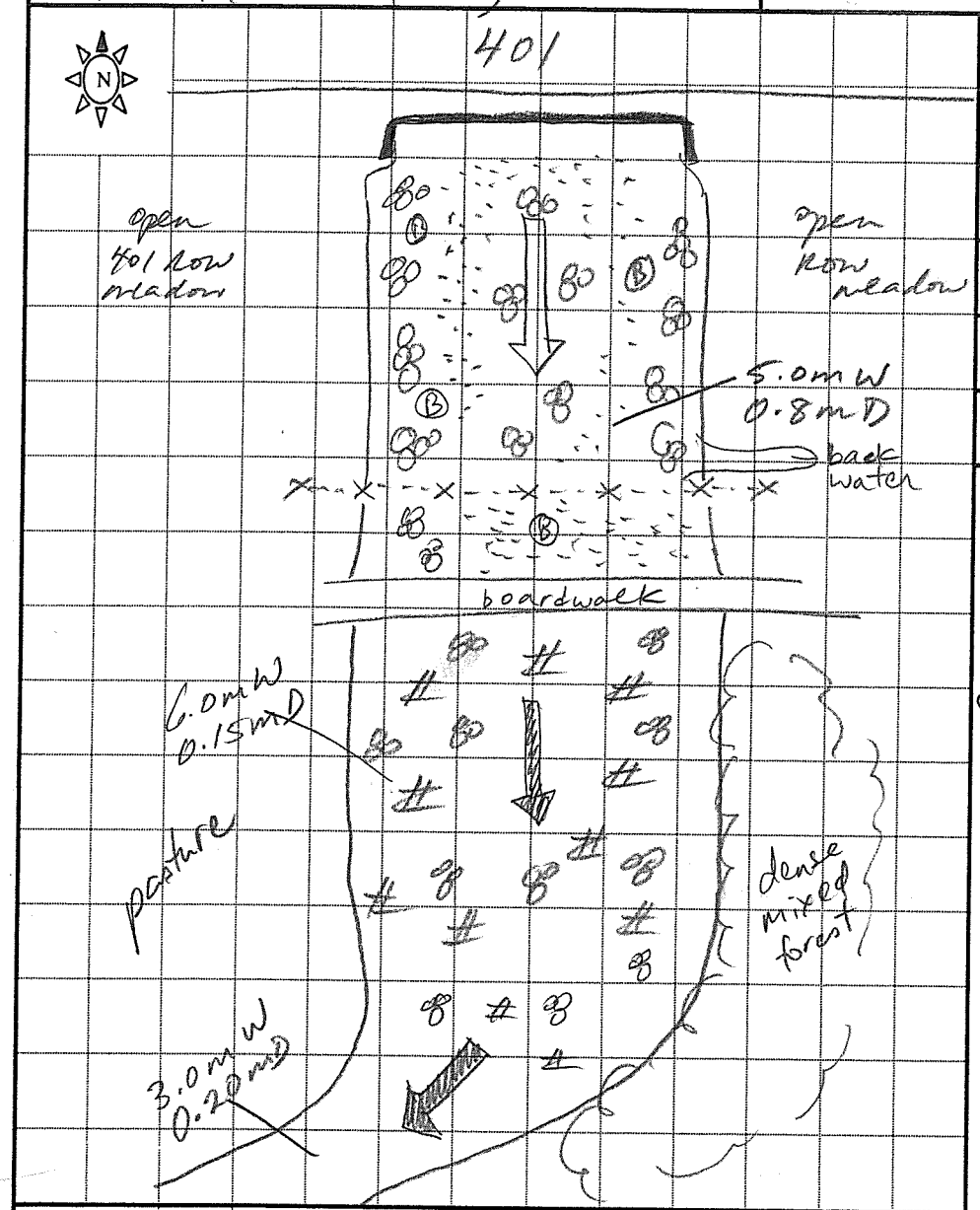
-x--x- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**

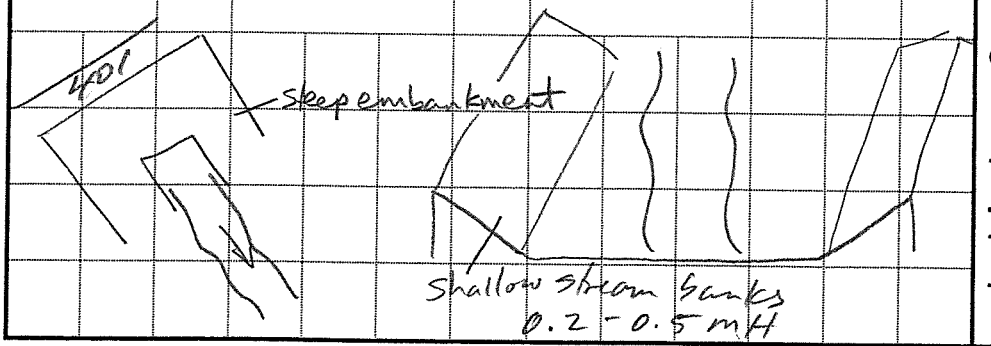


Trib 9

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Trib 9 (downstream)		50	1 / 1



PROFILE: Horz. Scale Vert. Scale



PROJECT #:	165001057
MAPPER:	MEllah
NAME OF WATERBODY:	Trib 9
CROSSING #:	
STATION #:	downstream
DATE: DD-MMM-YY	08-JUN-17

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

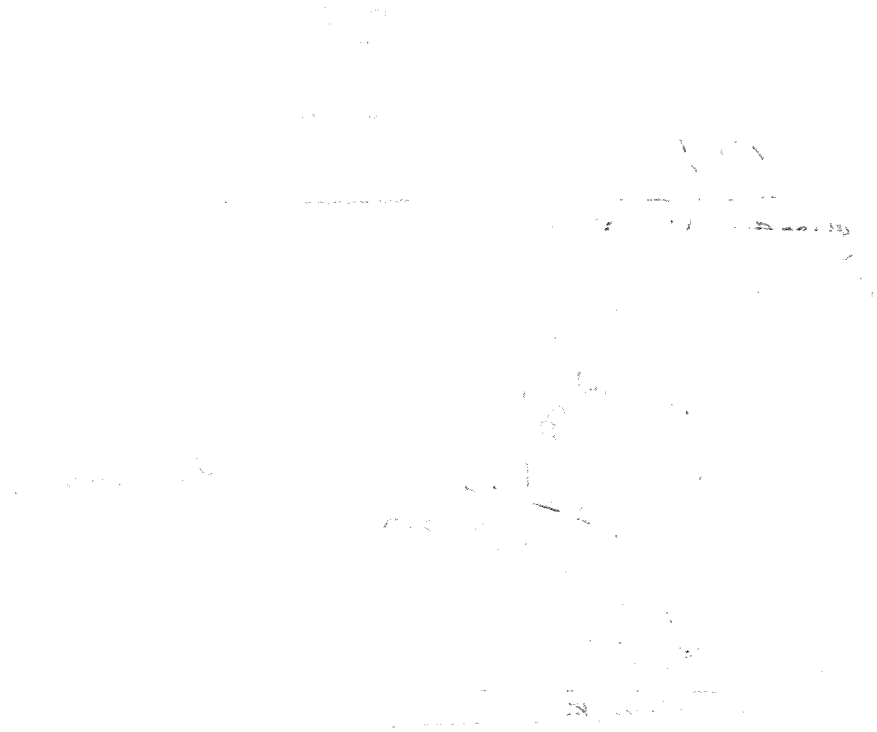
⊂⊃ Instream Log/Tree
^^^ Dam/Weir/Obstruction

Ⓡ Riparian Tree

├▶ Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert



Watercourse Field Record Form — Trib 10

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1105001057	Hwy 401	8	June	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + ME	sunny & warm	9:40	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	11.4° DO = 13.3	304 pH 8.16

PHOTO NUMBERS AND DESCRIPTIONS: d/s: 891-898 u/s: 991 - 1002

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Trib 10.	L. ON.	—	Trib 10

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 263515 E 4877898 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Ag	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: — Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☐	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m): 40 m u/s	CURRENT VELOCITY (m/s): slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	100	40		60		
Mean depth wetted (m)	0.15	0.7		0.18		
Mean width wetted (m)	0.7	5		1.7		
Mean bankfull width (m)	0.8	5		2		
Mean bankfull depth(m)	0.5	1m		0.4		
Substrate	Sa Gr	Si Mu		Si Mu		

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 10

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	X	X	X	Instream / Overhanging X	X	Instream 5 / Overhanging 5	90

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
			5	95
Predominant Species			watercress	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Brook trout if available	watercress d/s rear fence	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - incised run over sand, slight meander, grassy ROW
- scour @ bends rear culvert ~35cm deep

- d/s - altered, square, large pool @ culvert, narrows to flat through ROW fence & turns 90° to flow west along fence
- widens around curve to island ~50 m d/s
- a few small watercress @ d/s fence

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 10

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650001057	Hwy 401	8	June	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE & MC	5:10	

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm	Rippled	Wavy	Rough
	O	O	O	O

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 10	
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless Ø	Yellow/brown O	Blue/green O	Turbid O	Other O

GEAR

ELECTROFISHER: O

Length (m):	Settings:	Seconds:

NETS and TRAPS:

MINNOW TRAP: Ø # 2	DIP NET O	TRAP NET O
SEINE: O	GILL O	OTHER O specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Jun 8 2017 Time 5:30 pm	Clear Jun 9 2017 time 8:50 am
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT?	# OF BAGS	PRESERVATIVE:			
		Formalin O	Frozen O	Alcohol O	Other O
O Yes Ø No					

COMMENTS:

Additional Notes Appended? o No o Yes number of pages _____

Fish Community Inventory Record Form

Trib 10

CAPTURE INFORMATION

PROJECT NO.: **STATION NO.:**

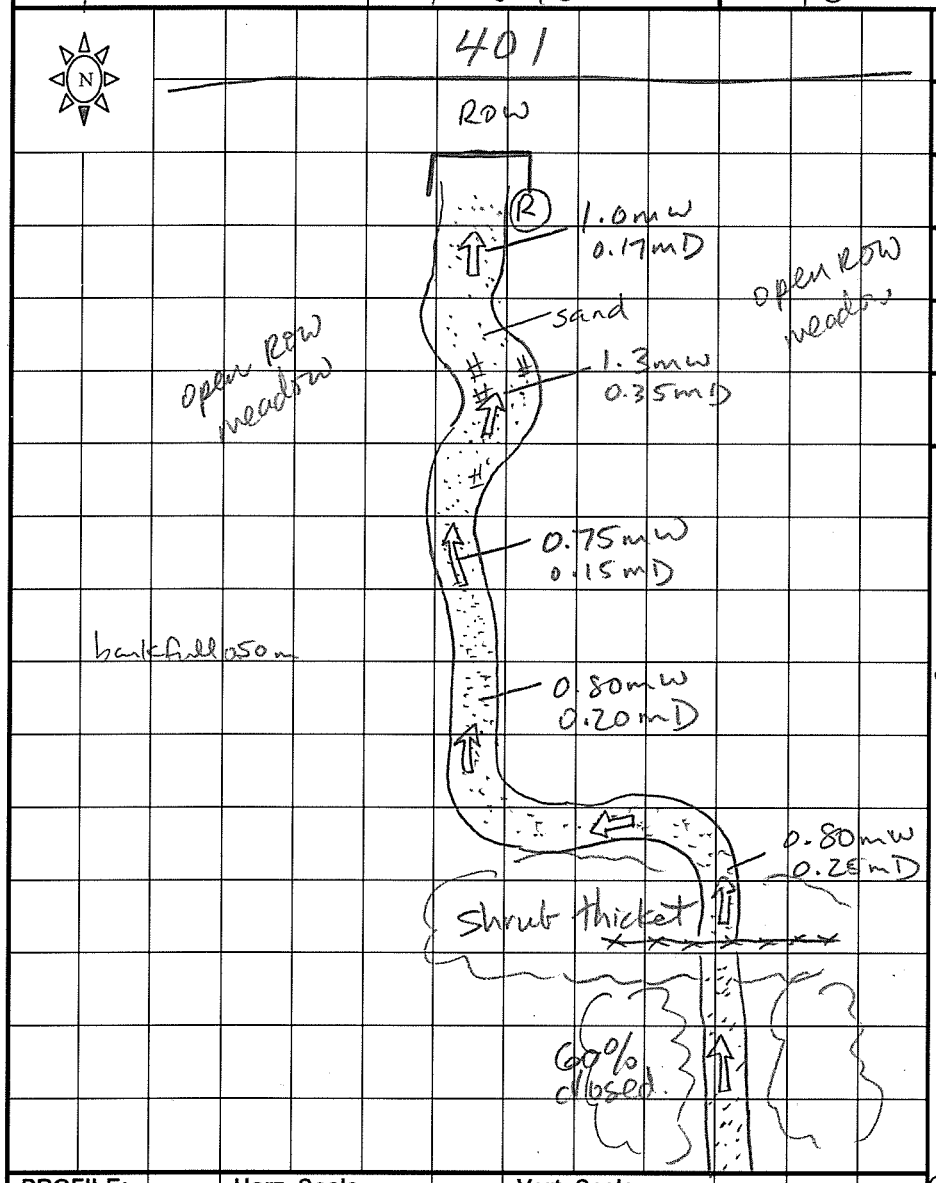
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
trap1 1	Creek chub				A
trap2 1	Creek Chub				
1	Blacknose Dace				

Circle number if a sample was kept

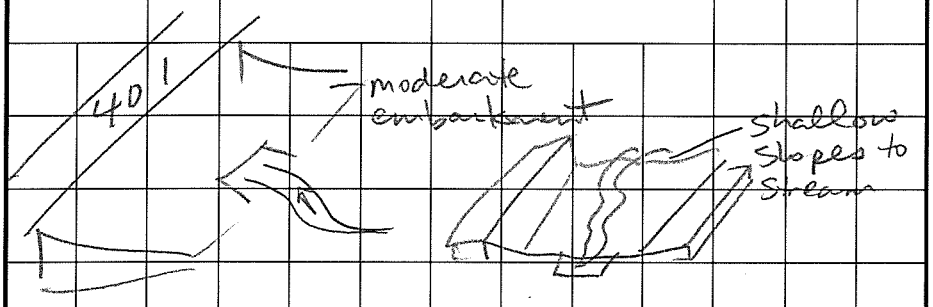
PAGE _____ of _____ **Number all pages**

Trib 10

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Trib 10	40	1 / 1



PROFILE: Horz. Scale: Vert. Scale



set MT 5:30

PROJECT #:	165001057
MAPPER:	MEllah
NAME OF WATERBODY:	Trib 10
CROSSING #:	
STATION #:	upstream
DATE: DD-MMM-YY	08-JUN-17

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

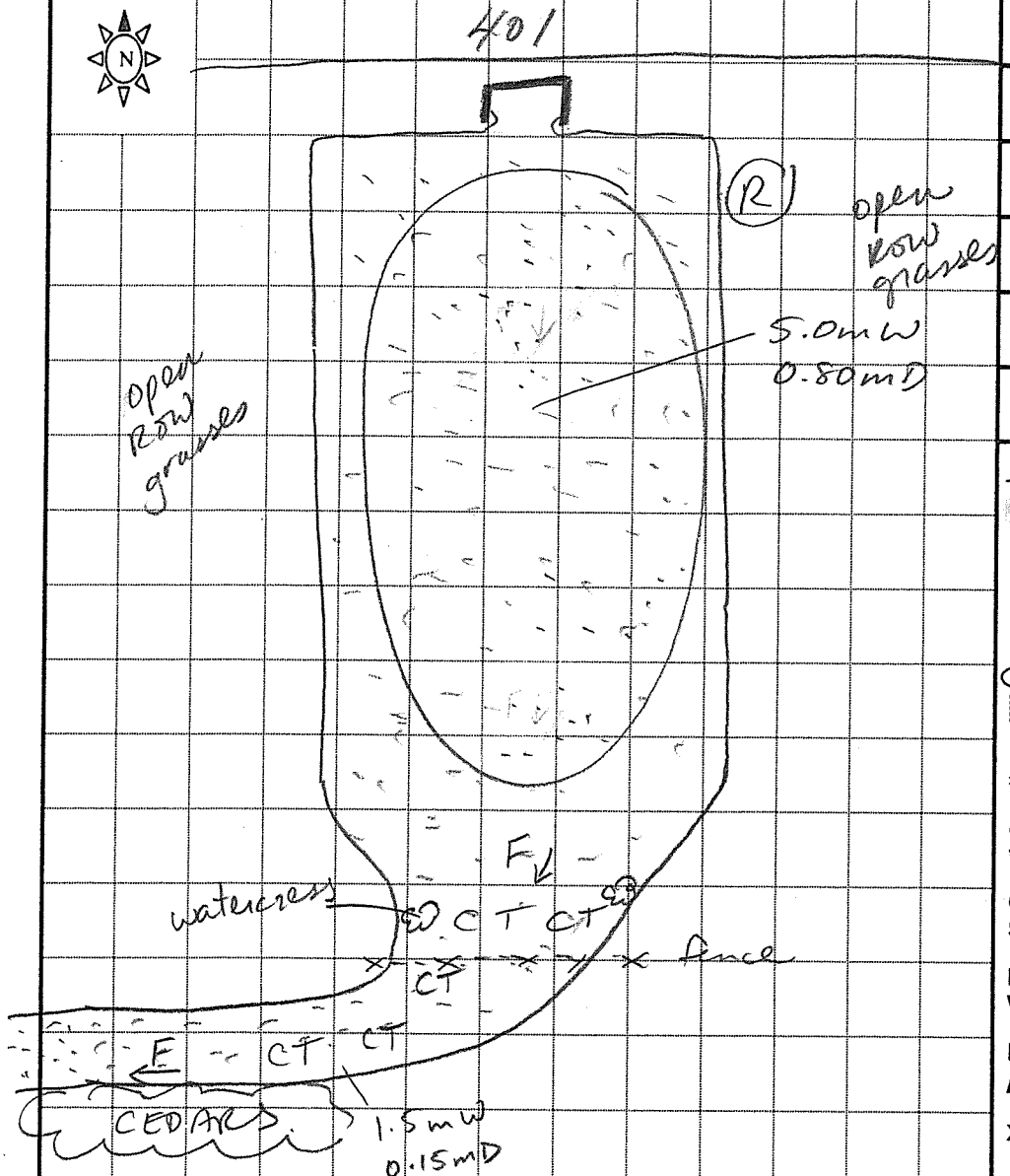
├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

Trib 10

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 10		1 - 1

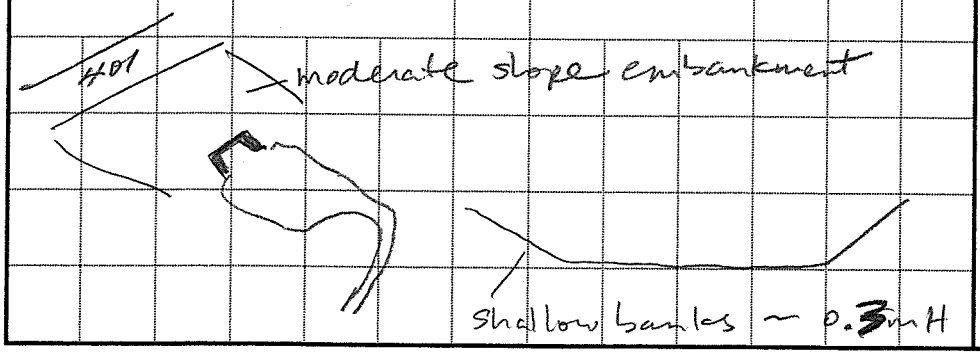


PROJECT #:	165001057
MAPPER:	MEllah
NAME OF WATERBODY:	Trib 10
CROSSING #:	
STATION #:	Trib 10 (downstream)
DATE: DD-MMM-YY	08-JUN-17

LEGEND

- F - flat
- **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**



Watercourse Field Record Form — Trib 11

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650010 57	Hwy 401 Colbors	8	June	2017

Is STREAM REALIGNMENT required for this section: ☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & ME	sunny & warm	10:10	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	11.6° DO = 14.17	552 pH 8.04

PHOTO NUMBERS AND DESCRIPTIONS: d/s; 899-908 u/s; 973-990

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed ~~Trib.~~ 11	L. ON.	—	Trib 11

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 263892 E 4877946 N	—
TOWNSHIP: —	**MNR DISTRICT:** Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Natural	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☒	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2 1.5 m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☐	☐	☐	cattails

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
60 m	slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other: trickle flow
Percentage of area						100 / 100
Mean depth wetted (m)						1-3cm / 0.05
Mean width wetted (m)						20-30cm / 0.3-0.5
Mean bankfull width (m)						1 / 3
Mean bankfull depth(m)						0.15 / ~0.5
Substrate						Mu D. / si Mu

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form Trib 11

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream / Overhanging	Organic debris	Vascular Macrophytes Instream / Overhanging	None
	X	X	X	X	X	Instream 95	5

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☒ u/s	☐	☐	☒ d/s	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
	—	—	95	
Predominant Species	—	—	CT. horsetail	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	—	low flow/dry	—

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	—	originates from ground u/s	—

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s – trickle flow through m/D + dense cedars, no defined channel or bed, seeps out of ground.
  - seep east of culvert 15m contributes flow 10-30cm wide + 1-3cm deep.

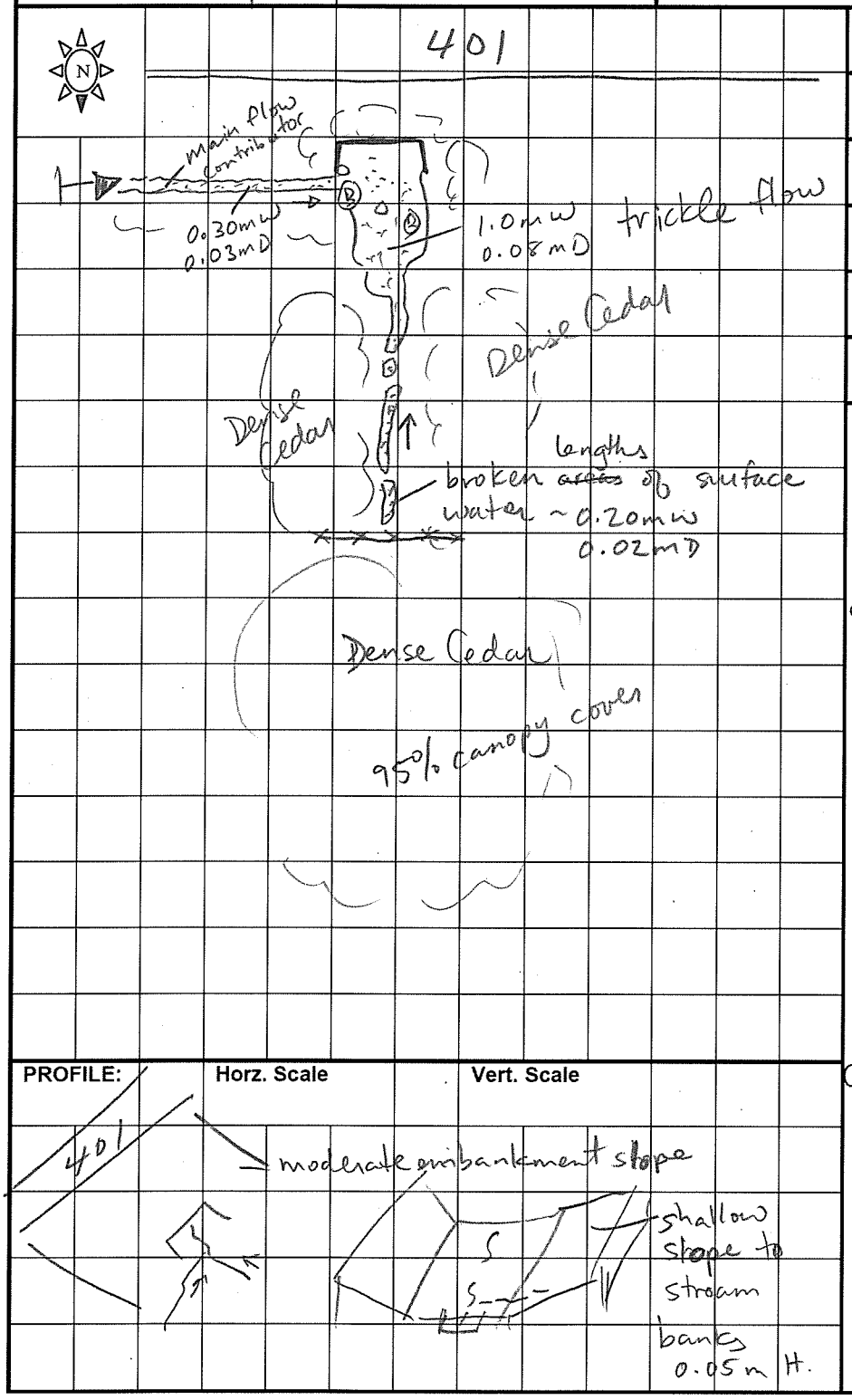
- d/s – trickle flow through dense CT wetland 30 cm wide, 6cm deep
  - turns + flows along fence to east + then south into woods.
  - channelized in woods ~50 cm wide + 50 cm deep

Additional Notes Appended? ☐ No ☐ Yes number of pages ______

★ too little water to fish!

Trib 11

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Trib 11 - upstream		25	1 / 1



PROJECT #:	16500057
MAPPER:	mEllah
NAME OF WATERBODY:	Trib 11
CROSSING #:	
STATION #:	upstream
DATE: DD-MMM-YY	08-JUN-17

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

Trib 11

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 11	50	1/1

PROJECT #: 165001057

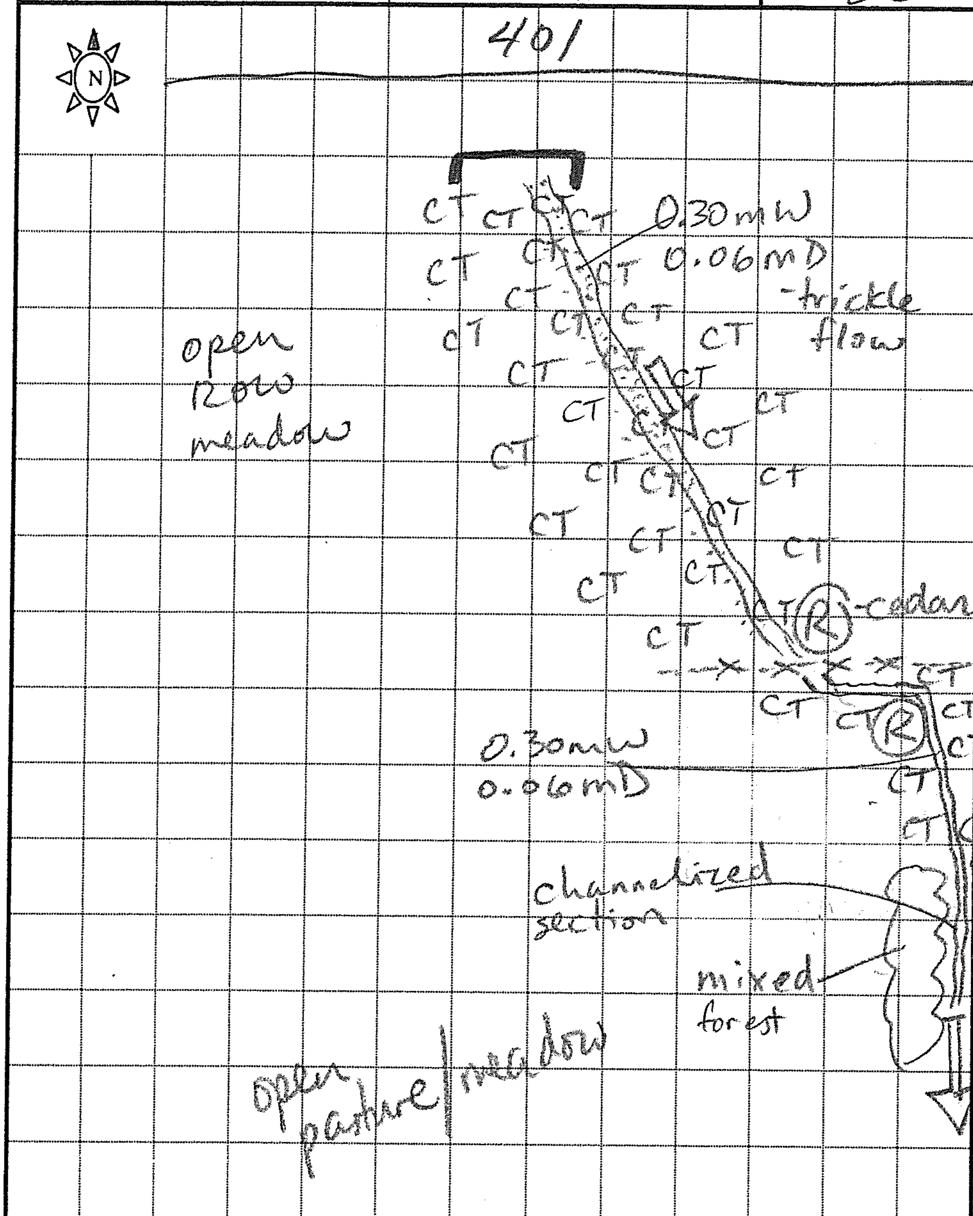
MAPPER: MEllah

NAME OF WATERBODY: Trib 11

CROSSING #:

STATION #: downstream

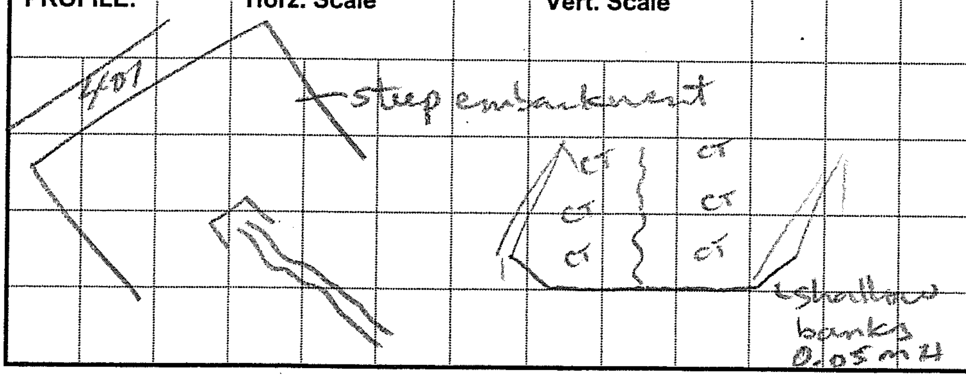
DATE: DD-MMM-YY 08-JUN-17



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**



Watercourse Field Record Form — Trib 12

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16500105-7	Hwy 401	8	June	2017

Is STREAM REALIGNMENT required for this section: ☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + MF		10:55	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	13.5° DO=12.84	327 pH 8.22

PHOTO NUMBERS AND DESCRIPTIONS: d/s: 909-920 u/s: 957-972

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 12	L. ON.	—	Trib 12

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 264988 E 4878088 N	/
TOWNSHIP: /	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
mixed forest.	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m² 1 8m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s.	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☑	☐	☒	☐	☐	n/a

TOTAL SECTION LENGTH (m): 25 m u/s 25 m d/s CURRENT VELOCITY (m/s): mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other scour pool
Percentage of area	45 / 25		50 / 50			5 / 25
Mean depth wetted (m)	0.15 / 0.2		0.1-0.15 / 0.1			0.2 / 0.8
Mean width wetted (m)	1.8 / 3		1.8 / 2.5			2.6 / 4
Mean bankfull width (m)	2.5 / 3.5		2.5 / 3			3 / 4
Mean bankfull depth(m)	0.5 / 0.5		0.5 / 0.5			~0.6 / ~1m
Substrate	Sa Gr Co / Gr-Co		Co Gr Sa / Co Gr			Sa Gr. / Co Bo Gr

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 12

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	15	1	5	Instream 10	X	Instream x	48
				Overhanging x	x	Overhanging x	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☑	☐	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
			1	99
Predominant Species			grass	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	✓	✓	✓

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout	Fe stains @ culvert seep u/s embankment	falls Fe stain u/s culvert drainage + seep west side u/s

POTENTIAL ENHANCEMENT OPPORTUNITIES:

- dense cedar forest u/s 100 cover

COMMENTS:

-u/s- riffle/run/riffle/scour/run/riffle over coarse substrates 1.2-2.0m wide + 0.15m deep on average
- ditch drainage down rip rap lined embankment near creek it has eroded embankment & Fe stains visible - steep u/s plunge pool, not likely A/A habitat
- d/s - scour pool @ culvert, run a riffle over coarse substrates
- seep ~ 5m east of creek u/s old rusty culvert

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 12

GENERAL INFORMATION				
PROJECT #: 1658001057	PROJECT DESCRIPTION: Hwy 401	DAY: 14	MONTH: June	YEAR: 2017
COLLECTORS: KE + JM		TIME STARTED:		TIME FINISHED:
WEATHER CONDITIONS:		SURFACE CONDITIONS (if applicable):		
		Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION	
NAME OF WATERBODY: unnamed Trib. 12	LOCATION OF STATION:
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒		
Length (m): 5m	Settings: 30Hz 150V	Seconds: 1663 s.

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☐ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐No ☐Yes number of pages _____

Fish Community Inventory Record Form

Trib 12

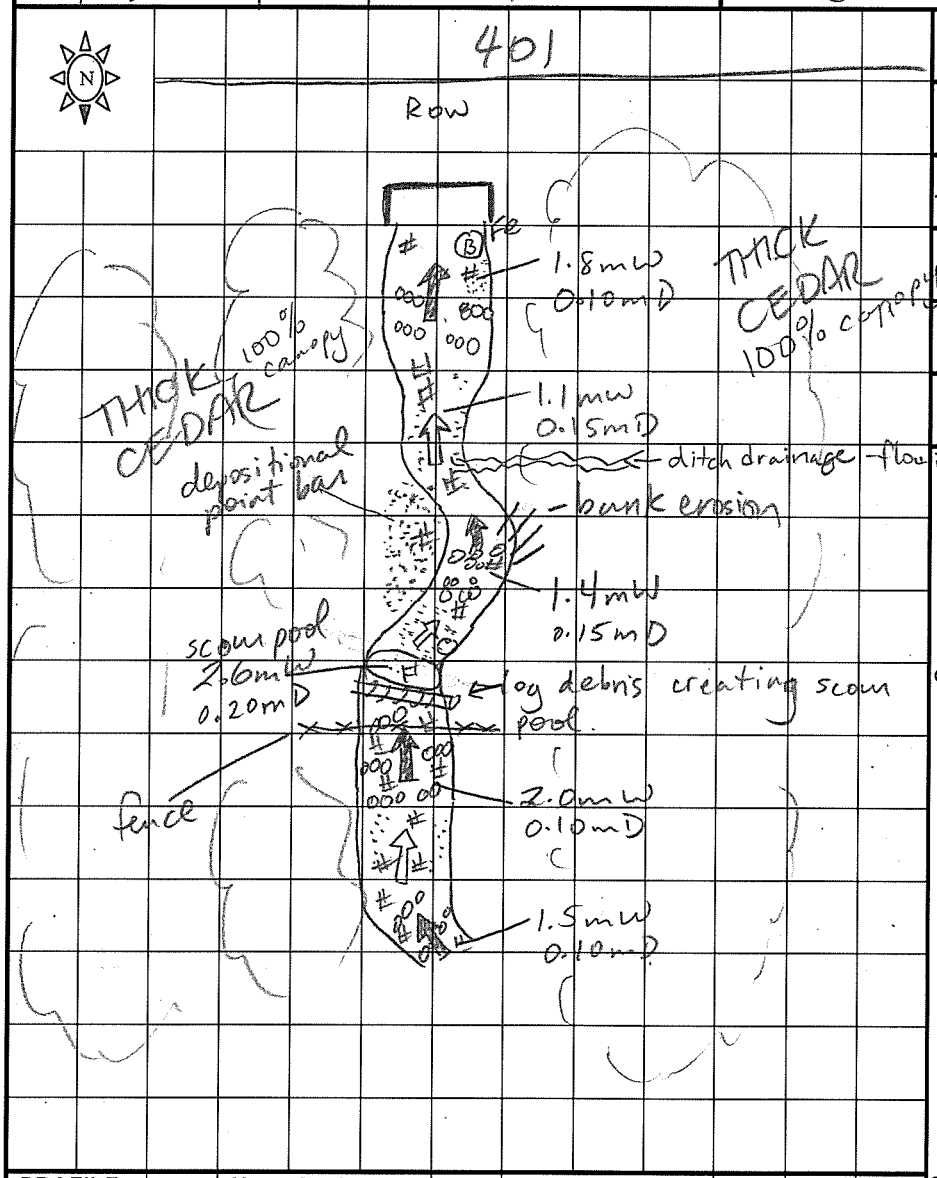
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
..	Brook Trout				A

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 12

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
Trib 12 - upstream	Trib 12	25	1 / 1

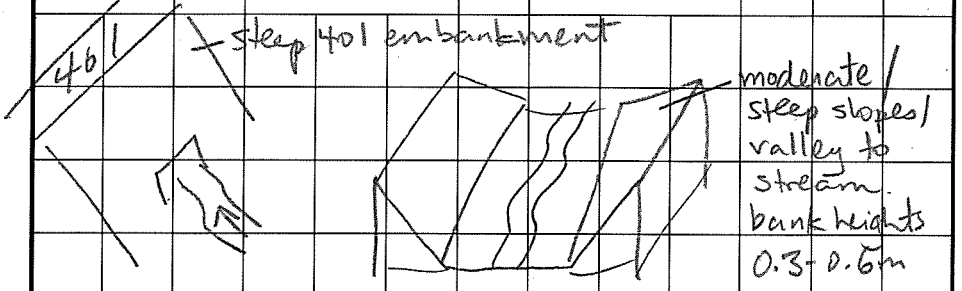


PROJECT #:
165001057
MAPPER:
MEllah
NAME OF WATERBODY:
Trib 12
CROSSING #:
STATION #:
upstream
DATE: DD-MMM-YY
08-JUN-17

LEGEND

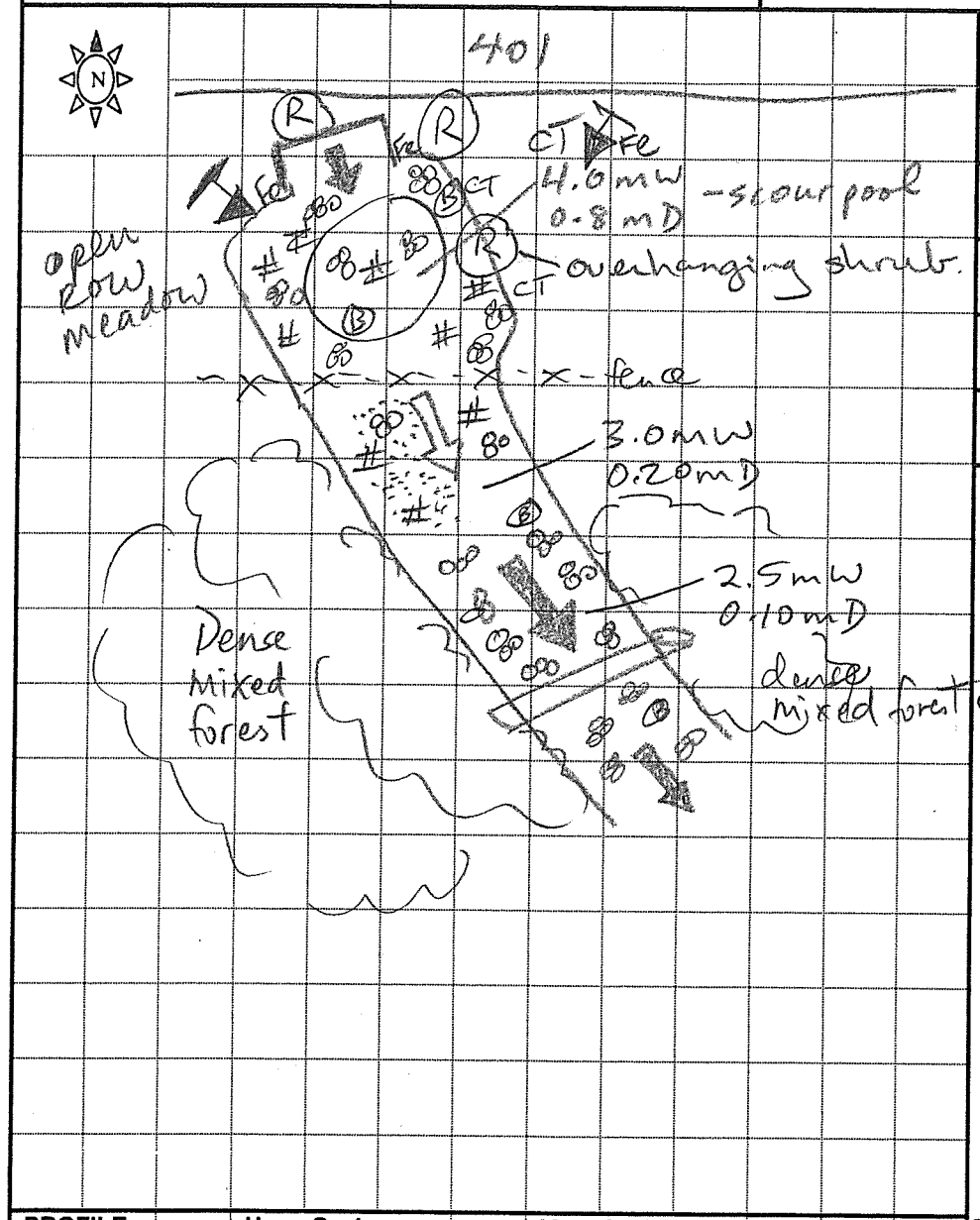
- **10d** depth (cm)
- **6w** width
- ➡ Riffle
- ⇨ Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- **oOooO** Cobble /Boulder
- *** * *** Debris
- **CT** Cattail
- **SV/FV** Submerg/Float Veg
- **EV** Emergent Vegetation
- **W** Watercress
- **Fe** Iron Staining
- **//////** Eroded 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**



Trib 12

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib 12	25	1 | 1



PROJECT #:	MAPPER:	NAME OF WATERBODY:	CROSSING #:	STATION #:	DATE: DD-MMM-YY
165001057	MEllah	Trib 12		downstream	08-JUN-17

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

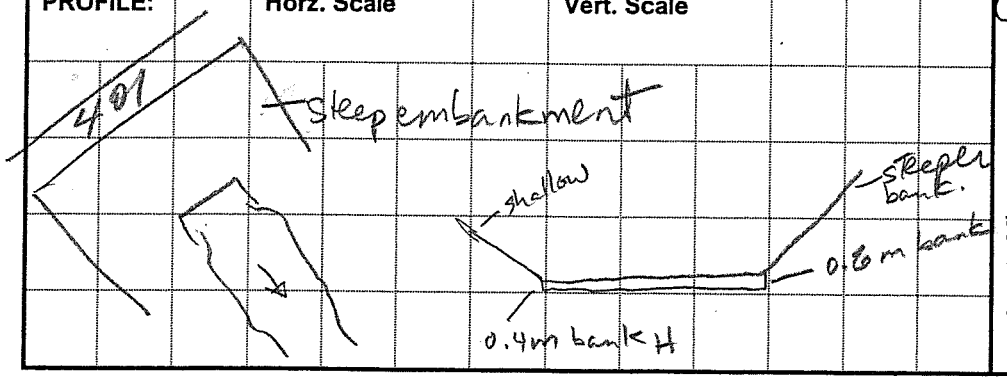
⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

├▶ Seep/Spring
-------- Undercut Bank
Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

PROFILE: **Horz. Scale** **Vert. Scale**



Watercourse Field Record Form — Trib 13

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1649001057	Hwy 401	8	June	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☑ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE ME & BO	sunny & hot	1:30	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	16.9° DO = 11.34	1016 pH 7.97

PHOTO NUMBERS AND DESCRIPTIONS: d/s: 921–932, interchange: 933–948, u/s: 949–956

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 13	L. ON.		Trib 13

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 267367E 4878575 N	
TOWNSHIP:	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
township cemetery highway	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☒ x2	N/A ☐

Other ☐ Describe: | Size (w x h) m²

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	CT d/s of interchange

TOTAL SECTION LENGTH (m): 10m w/s 150 m	CURRENT VELOCITY (m/s): mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	48	2	100 35	15		
Mean depth wetted (m)	0.22	0.65	0.05 0.1–0.15	0.05		
Mean width wetted (m)	1–1.5	3	0.5–1.2	0.7–1		
Mean bankfull width (m)	2	3	1.5 2	1.5		
Mean bankfull depth(m)	~0.8	n/m	0.8 ~0.7	0.4		
Substrate	Br Co Bo	Gr Co	Co Gr Bo Br Co	Sa Gr		

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 13

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	X	X	30	Instream X Overhanging 5	X	Instream 5 20 Overhanging 20	20

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
			1	99
Predominant Species			CT	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
			60cm ledge d/s

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout d/s.		

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - riffle area co/gr in concrete lined channel @ culvert
  - large catch basin/drain
  - u/s of fence dense veg & CT channel - no access.

- d/s - concrete lined from culvert ~7m to ledge + plunge pool ~60cm tall pool 70cm deep, gr/co lined boulder cascade @ 35m d/s 1.2m & 0.1m deep
  - bo/gr/sa run d/s

barrier

d/s interchange - run into flat over gr/sa 90cm wide + 5cm

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 13

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16500105?	Hwy 401	8	June	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE + ME + BO	3:30	

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm	Rippled	Wavy	Rough
	Ø	O	O	O

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 13	
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless Ø	Yellow/brown O	Blue/green O	Turbid O	Other O

GEAR

ELECTROFISHER: Ø

Length (m): 50 m	Settings: 60 Hz 150 V	Seconds: 343 s

NETS and TRAPS: 2 nets

MINNOW TRAP: O #	DIP NET O	TRAP NET O
SEINE: O	GILL O	OTHER O specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT?	# OF BAGS	PRESERVATIVE:			
O Yes O No		Formalin O	Frozen O	Alcohol O	Other O

COMMENTS:

Additional Notes Appended? o No o Yes number of pages _____

Fish Community Inventory Record Form

Trib 13

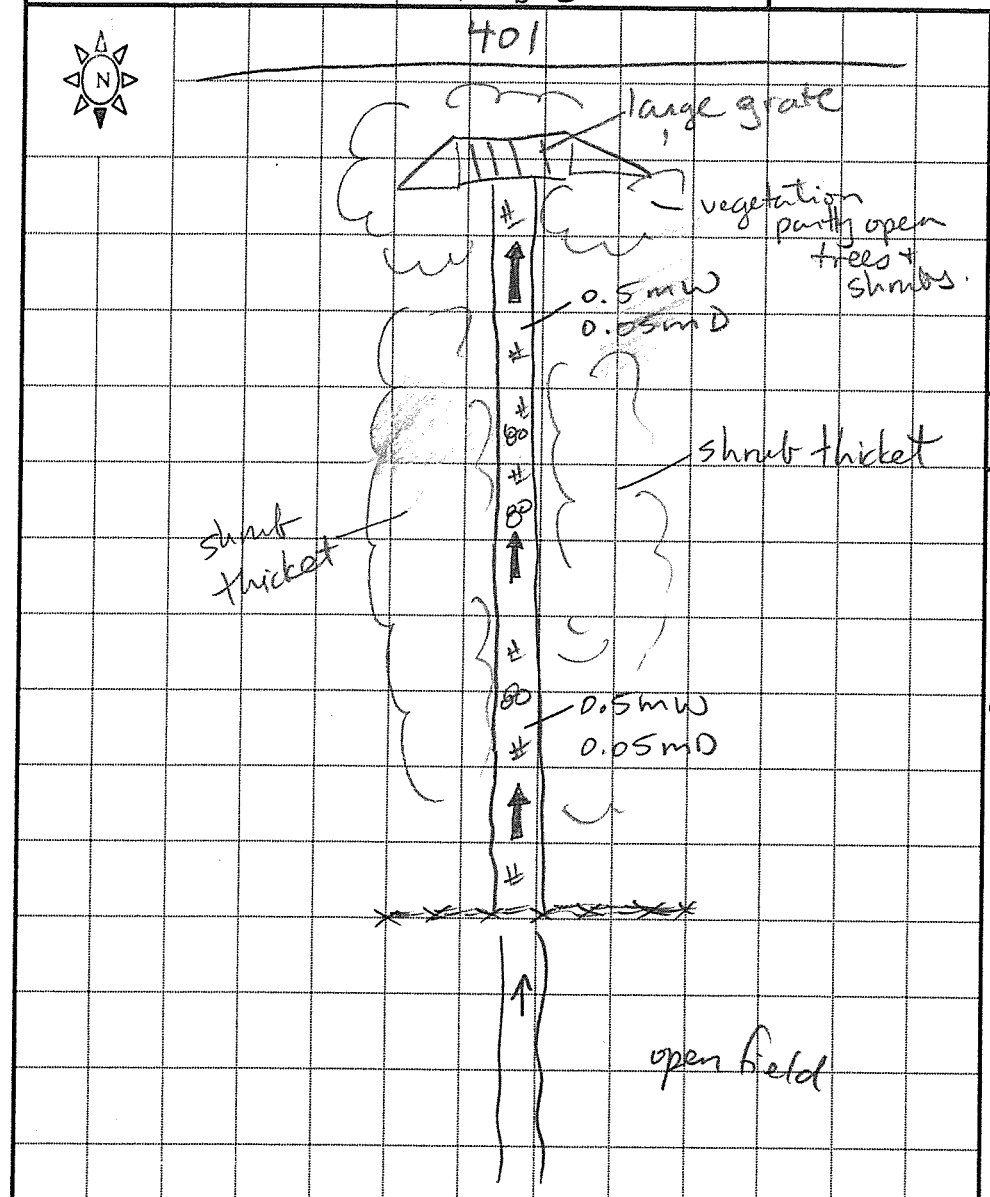
CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
4	Blacknose Dace				A
1	Creek Chub				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 13

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
upstream	Trib 13		1-1



PROJECT #: 16500105 7

MAPPER: mEllah

NAME OF WATERBODY: Trib 13

CROSSING #:

STATION #: upstream

DATE: DD-MMM-YY 08-JUN-17

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

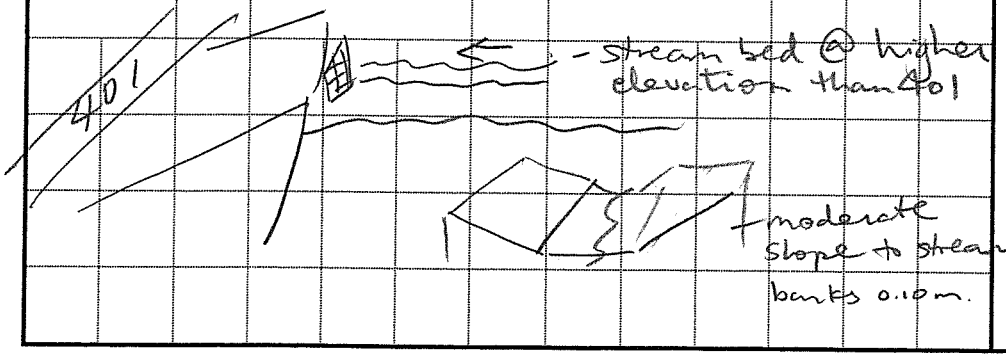
® Riparian Tree

⊢▶ Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
⊔ Culvert

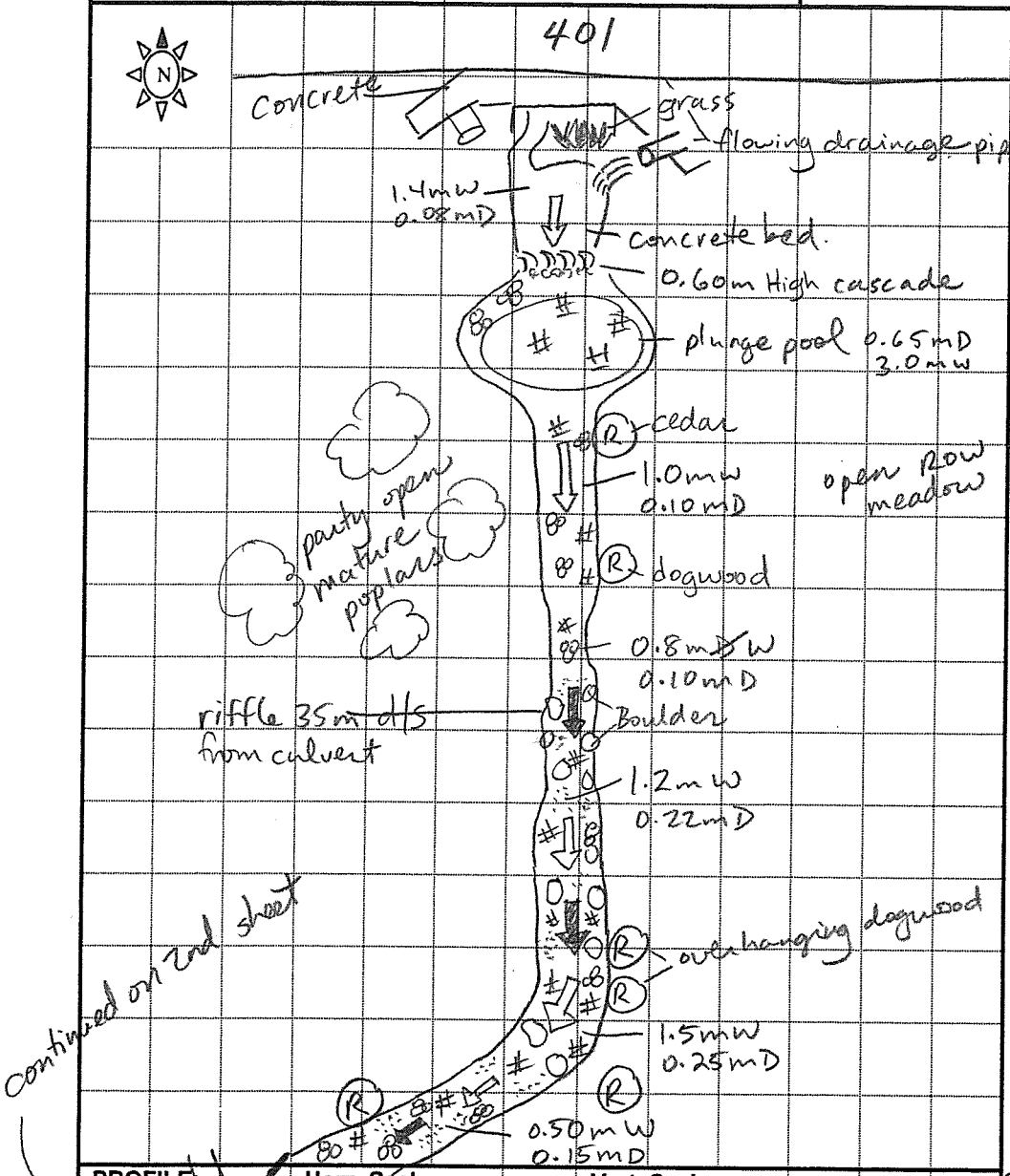
PROFILE: **Horz. Scale** **Vert. Scale**



downstream assessment

 Trib 13

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream	Trib ~~12~~ 13		1/1



PROFILE: Horz. Scale Vert. Scale

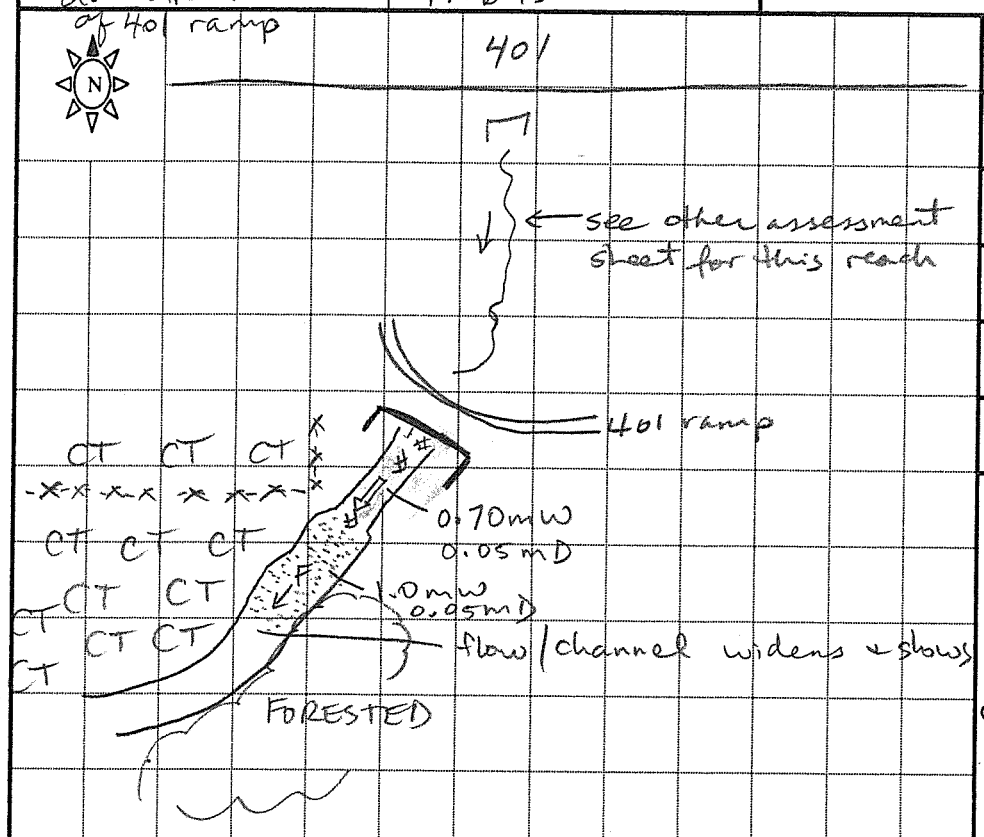
PROJECT #:	165001057
MAPPER:	MEllah
NAME OF WATERBODY:	Trib 13
CROSSING #:	
STATION #:	downstream
DATE: DD-MMM-YY	08-JUN-2017

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

downstream assessment
page 2 of 2 Trib 13

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
downstream of 401 ramp	Trib 13		1 / 1



PROJECT #:	MAPPER:	NAME OF WATERBODY:	CROSSING #:	STATION #:	DATE: DD-MMM-YY
16500105 7	MEllah	Trib 13		downstream of 401 ramp	08-JUN-17

LEGEND

F→ - flat
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

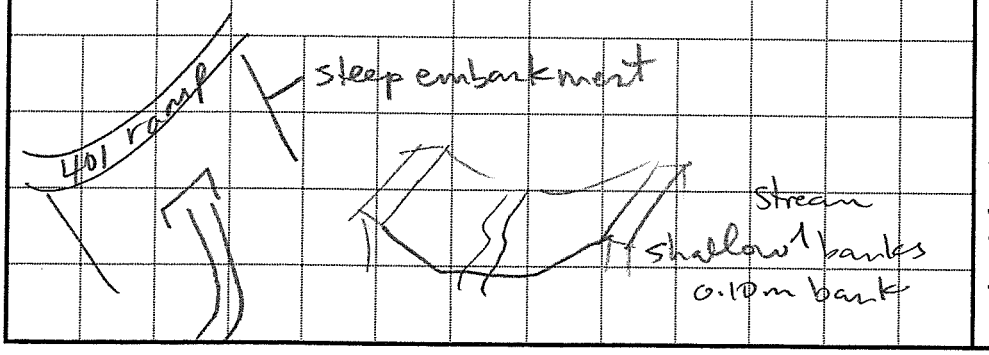
® Riparian Tree

├► Seep/Spring
-------- Undercut Bank

— Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
└┘ Culvert

PROFILE:	Horz. Scale	Vert. Scale



APPENDIX D2: SUMMER (SEPTEMBER 2017)

Stantec

Watercourse Field Record Form

Trib ØA

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1165 0105	Hwy 401	20	Sept.	2017

Is STREAM REALIGNMENT required for this section:

☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + JSC	hot & sunny		

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	too little to YSI	

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1954-1963 d/s: 1904-1909

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib ØA	Lake Ontario	—	Trib ØA

LOCATION OF CROSSING:

east of Nagle Rd.

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 728196 E 4875011 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
commercial	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☐	☐	☐	☒	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s): slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other Trickle
Percentage of area						dry / 100
Mean depth wetted (m)						/ 1 cm
Mean width wetted (m)						/ 10 cm
Mean bankfull width (m)						/ 3m
Mean bankfull depth(m)						/ >0.5
Substrate						/ co Sa

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib OA

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☒	☐	☐	☐
Right Upstream Bank	☒	☐	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	5	5	Instream / Overhanging /	/	Instream / Overhanging /	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒ beyond ROW	☒ ROW	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
				100
Predominant Species	/	/	/	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	low flow	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	/	/	/

POTENTIAL ENHANCEMENT OPPORTUNITIES:

↑ riparian cover
improve connection to u/s wetland, u/s of culvert.

COMMENTS:

- u/s - completely dry in ROW, puddle @ ROW fence & moist to 1 cm deep beyond.

- d/s - trickle flow through culvert & up rap lined channel & into adjacent bush

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Watercourse Field Record Form — Trib ØB

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
160601057	Hwy 401	20	Sept	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & JSC			

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	17.7° DO=7.16	586 pH 8.28

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1943-1953 d/s: 1910-1920

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib ØB	L. ON.	—	Trib ØB

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 729475 E 4875475 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
cedar bush	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m² 4m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
30 u/s + 25 d/s	slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	50 / 70		50 / 30			
Mean depth wetted (m)	0.2 / 0.15		0.1 · 0.1 / 0.05			
Mean width wetted (m)	3 / 3		2. / 2.5			
Mean bankfull width (m)	4 / 4		3 / 4			
Mean bankfull depth(m)	>0.5 / >0.6		0.5 / >0.6			
Substrate	sa/si / si: my sa		gravel / co sa			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 03

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☑	☐	☐	☐
Right Upstream Bank	☑	☐	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	/	10	Instream / Overhanging 10 dls	/	Instream 5 Overhanging 5	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☐	☑	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent 20	None 80
Predominant Species	/	/	watercress speedwell	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	/	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		waterkress dls	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

-u/s - run/riffle sequence - wc beyond ROW right side
- run - sa/silt ~3m wide + 20cm deep
- riffle ulm ROW over riverstone ~2m wide
- small drainage from adjacent wetland pocket dry 10-15 cm deep
riprap lead to culvert on west side
-dls - trickle in ditch riprap channel, flows under riprap to culvert @ edge
- run/riffle sequence, shallow flow
fine cobble

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Watercourse Field Record Form — Trib ØC

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650105-7	Hwy 401	26	Sept	2017

Is STREAM REALIGNMENT required for this section: ☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & JSC			

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	17.1° DO= 7.26	693 pH 8.10

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1921 - 1930 d/s: 1935 - 1942

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. ØC	L. ON.	/	Trib. ØC

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 729973 E 4875846N	/
TOWNSHIP: /	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
wetland & cedars	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☑ 1.2m	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: | Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☐	☐	☒	☐	☐	CT

TOTAL SECTION LENGTH (m): outside Row / in Row	CURRENT VELOCITY (m/s):

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other trickle
Percentage of area	100	100				100
Mean depth wetted (m)	?	0.1				0.02
Mean width wetted (m)	~1.5	1.5				n/a
Mean bankfull width (m)	~	2				3.
Mean bankfull depth(m)	?	>0.3				0.3
Substrate	?	si gr mu				Sa Mu

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib OC

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☒	☐	☐	☐
Right Upstream Bank	☒	☐	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	4	1	Instream / Overhanging /	/	Instream 100 u/s Overhanging	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	/	/	watercress + CT	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	low flow	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		watercress!	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

* school of YOY cyprinids observed in d/s pool

COMMENTS:

-u/s - CT wetland @ & beyond ROW
- dense watercress @ culvert, no observable channel, just trickle flow through veg

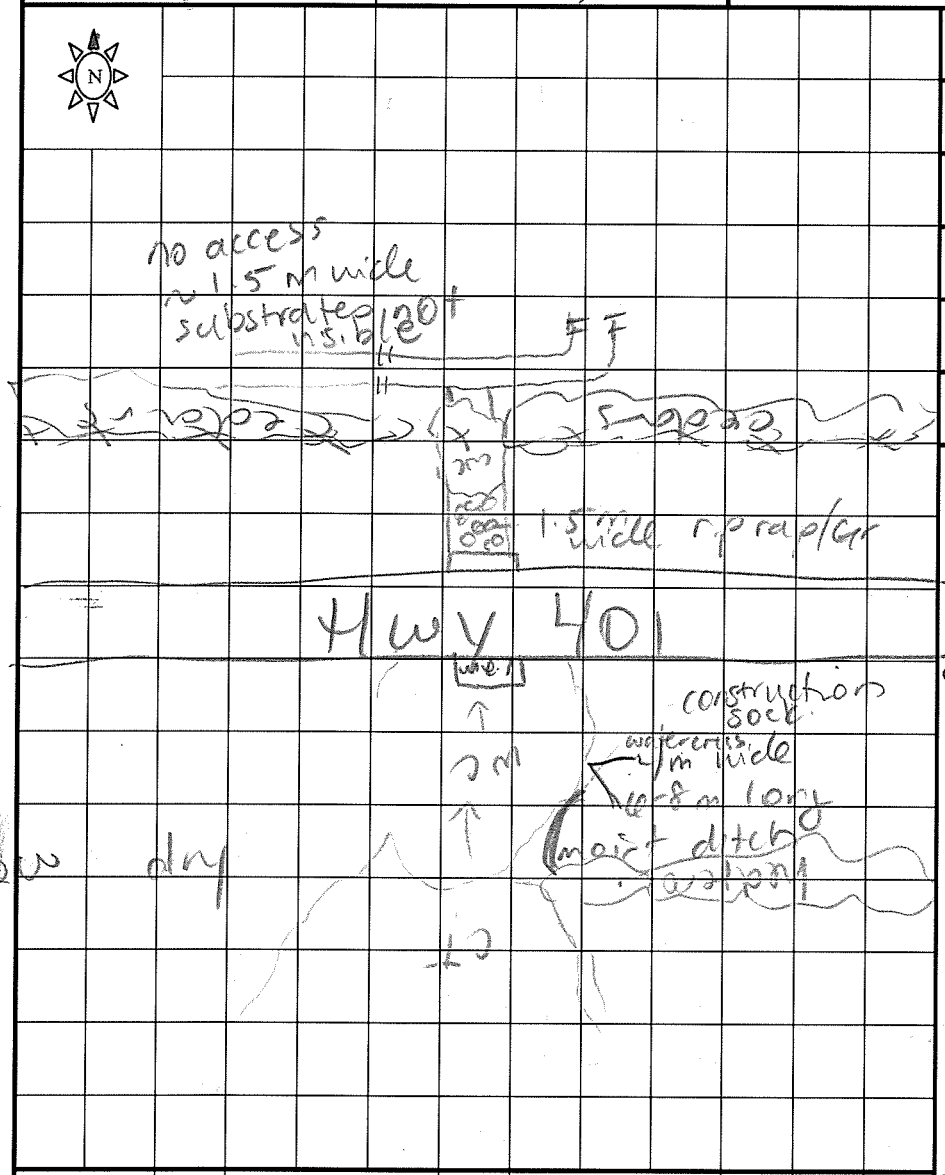
-d/s - pool @ 1.5 - 0.1 m deep w/ silt/fine/mud
- dense watercress 3 m beyond culvert to ROW fence
- beyond ROW fence channel observed ~1.5 m wide

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

flows toward ROW just east of culvert & west, outside of ROW fence

Trib ØC

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
d/s + d/s	Trib ØC		



PROFILE:	Horz. Scale	Vert. Scale

PROJECT #:	1650010557
MAPPER:	K Easterling
NAME OF WATERBODY:	Trib ØC
CROSSING #:	
STATION #:	u/s & d/s
DATE: DD-MMM-YY	Sept 20 2017

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

Watercourse Field Record Form

Trib 1

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1605001057	Cobalt	17	Sept	2017

Is STREAM REALIGNMENT required for this section:

O Yes O No Ø Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + JSC		8:50	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	12.6° DO = 9.58	520 DH = 8.32

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1894 - 1903 d/s: 1527 - 1535

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 1	L. ON.	—	Trib 1

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 732308 E 4876453 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
cedar forest	run-off

EXISTING STRUCTURE TYPE

Bridge O	Box Culvert Ø	Open Foot Culvert O	CSP O	N/A O

Other O Describe: Size (w x h) m² 2.5 m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	O	O	Ø	O	O	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
20 m	mod.

SUB-SECTION(S)	Run O	Pool O	Riffle O	Flats O	Inside culvert O	Other riffle cascade
Percentage of area	30	10	60			100
Mean depth wetted (m)	0.1	0.4	0.07			0.05-0.1
Mean width wetted (m)	2	2	2			1-2m
Mean bankfull width (m)	2.5	2-3	2.5			3
Mean bankfull depth(m)	>0.5	>0.5	>0.5			0.3-0.4
Substrate	Gr Sa Co	Sa & Gr.	Co Sa Gr			Bo/Co/Gr Sa

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Tr61

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	0	0	0	0
Right Upstream Bank	0	0	0	0

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	10	/	5	Instream 5 Overhanging 5	/	Instream / Overhanging	75

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	0	0	0	0	0

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	/	/	/	

MIGRATORY OBSTRUCTIONS:	None	Seasonal ~40cm cascade ROW fence	Permanent
	/		/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout	Fe stains u/s + d/s	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

d/s riffle/pool/riffle/run/pool sequence
coarse substrates.
-40 cm cascade beyond ROW

u/s - riffle/cascade over boulder/cobble.
Fe stain left bank @ culvert
-dense cedar bush
-slight undercut banks

Additional Notes Appended? O No O Yes number of pages _____

Fish - 2 YOY Brook Trout.

Fish Community Inventory Record Form

Trib 1

GENERAL INFORMATION				
PROJECT #: 165001057	PROJECT DESCRIPTION: Hwy 401 Cobourg	DAY: 18	MONTH: Sept	YEAR: 2017
COLLECTORS: KE & JSC		TIME STARTED:	TIME FINISHED:	
WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable): Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION	
NAME OF WATERBODY: unnamed Trib 1	LOCATION OF STATION:
TOWNSHIP: /	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒		
Length (m): 15	Settings: 25 Hz 150 V	Seconds:
NETS and TRAPS:		
MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify
HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☐ No	# OF BAGS	PRESERVATIVE: Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
2	YOY Brook Trout				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

Trib 2

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1605001057	Hwy 401 Cobourg	18	Sept	2017

Is STREAM REALIGNMENT required for this section:

☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & JSC			

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	12.7 DO=9.08	493 pH 8.19

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1888 - 1893 d/s: 1536 - 1550

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 2	L. ON.		Trib 2

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 733246 E 4876374 N	
TOWNSHIP:	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
mixed forest	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☒	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m² 3.8m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☐	☐	☒	☐	☐	CT

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
	slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	20	80		unknown	u/s	
Mean depth wetted (m)	0.1	0.6				
Mean width wetted (m)	1.5	4.5				
Mean bankfull width (m)	2	5				
Mean bankfull depth(m)	>0.1	>1m				
Substrate	Co Sa	Co Sa				

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Tnb 2

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☑	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	10	/	5	Instream / Overhanging	/	Instream / Overhanging 5	80

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☑ d/s	☑ u/s	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	/	/	watercress	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		Fe + watercress	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

-u/s- wetland blw highway + side road u/s standing water - catch basin into culvert
- u/s end of culvert likely beyond Row of side road
d/s- large pool full of Brook Trout transitional to narrow run over coarse substrates
Fe ~~left~~ left bank, watercress right

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 2

GENERAL INFORMATION				
PROJECT #: 16TP0105 7	PROJECT DESCRIPTION: Hwy 401 Cobourg	DAY: 18	MONTH: Sept.	YEAR: 2017
COLLECTORS: KE & JSC		TIME STARTED:		TIME FINISHED:
WEATHER CONDITIONS:		SURFACE CONDITIONS (if applicable):		
		Calm ☐	Rippled ☐	Wavy ☐	Rough ☐
GENERAL LOCATION				
NAME OF WATERBODY: unnamed Trib. 2		LOCATION OF STATION:		
TOWNSHIP:		MNR DISTRICT: Peterborough		

SAMPLING LOCATIONS AND WATER CHEMISTRY						
LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR		
ELECTROFISHER: ☒		
Length (m):	Settings: 25 Hz 200 V	Seconds:
NETS and TRAPS:		
MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify
HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
FISH KEPT? ☐ Yes ☒ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:
Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 2

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
10	Brook Trout				
1	YOY Brook Trout				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

Trib 3

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650001057	Hwy 401	18	Sept.	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & SSC			

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	13° DO = 8.12	769 DO-8.08

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1868 - 1887 d/s: 1551 - 1563

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 3	L. ON.	—	Trib 3

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 735157 E 4875780 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
mixed forest.	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2 1.8m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☐	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
20 m	slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert: ☒	Other
					riffle	cascade
Percentage of area		80			100	20
Mean depth wetted (m)		0.12			0.02	0.02
Mean width wetted (m)		1.8			0.2-0.4	1m
Mean bankfull width (m)		2.5			2	1.5
Mean bankfull depth(m)		>0.6			0.4	0.15
Substrate		Cl Si Gr Co			Bo Co	Gr Co

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form — Trib 3

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☐	☒	☐
Right Upstream Bank	☐	☐	☒	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	10	/	5	Instream 10 Overhanging 10	/	Instream / Overhanging	65

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☒	☐	☒ u/s	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
		/		
Predominant Species	/	/	/	

MIGRATORY OBSTRUCTIONS:	None	Seasonal 5cm-15cm low flow over cascades	Permanent perched culvert 1.6m

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning potential	Evidence of Groundwater watercress u/s culvert	Other —

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s – moist to dry channel from east, channelised by flow, 0.5-1m wide & sa/Bo substrates
  - main source of flow from west, through rip rap
  - rip rap mound near culvert barrier in low flow
  - 0.5 wide 1-2 cm deep, or silt
  - drains from phrag/ct to west
- d/s perched culvert pool/cascade sequence substrates co gr cl si!

u/s wetland appears to be a large seep, lots watercress + trickling water in phrag/CT to culvert

Additional Notes Appended? ☐ No ☐ Yes number of pages ______

- large pool @ 2nd culvert to west ~35cm deep in dense phrag

Fish Community Inventory Record Form

Trib 3

GENERAL INFORMATION				
PROJECT #: 10500105 7	PROJECT DESCRIPTION: Hwy 401 Cobourg	DAY: 18	MONTH: Sept	YEAR: 2017
COLLECTORS: KE & JSC		TIME STARTED:		TIME FINISHED:
WEATHER CONDITIONS:		SURFACE CONDITIONS (if applicable):		
		Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION	
NAME OF WATERBODY: Unnamed Trib. 3	LOCATION OF STATION:
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR		
ELECTROFISHER: ☒		
Length (m):	Settings: 25Hz 200 V	Seconds: 153 s
NETS and TRAPS:		
MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify
HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION					
FISH KEPT? ☐ Yes ☒ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 3

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
1	YOY Rainbow Trout				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

Trib 4

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
11QK001057	Hwy 401 Cobourg	18	Sept	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & JSC	hot & sunny		

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	13.8 DO = 7.99	496 pH 8.29

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1858 - 1867 d/s: 1564 - 1597

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 4	L. ON.	—	Trib 4

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 736569 E 4876090 N	—
TOWNSHIP: Forest	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☒ Describe: Arch concrete culvert Size (w x h) m² 8m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	Reed

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
	mod

SUB-SECTION(S)	Run ☐	Pool ☒ pl	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	50 / 90	1	50 / 10			
Mean depth wetted (m)	0.3-0.4 / 10-20m	25	0.1 / 0.05			
Mean width wetted (m)	4 / 4m	6m	4 / 3-4			
Mean bankfull width (m)	4.5 / 4.5	8m	4.1 / 4.5			
Mean bankfull depth(m)	>0.8m / >0.5	>0.7	0.6 / >0.5			
Substrate	Bo Gr Sa / Si Gr Co	Gr Co	Bo/Gr / Gr Co			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 4

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	5	/	2	Instream 5 Overhanging 5	/	Instream 3 Overhanging 5	75

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☑	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	/	/	watercress	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	20cm cascade out of culvert	culvert to non-jumpers

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	yes.	watercress FE right side dls	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s- wide slow run into culvert BO/GR/SI
  - riffle over BO/ u/s of ROW
  - water cress on left bank
  - unlikely u/s passage though culvert for non-jumpers

-d/s cascade/riffle/run over gr/co/ra substrates primarily run habitat -
soft substrates on right bank where lamprey caught.

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 4

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1685 01057	Hwy 401	18	Sept	2007

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE + JSC		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
hot + sunny	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
Unnamed Trib. 4	
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒

Length (m):	Settings: 25 47 200V	Seconds: 201

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☒ No	# OF BAGS	PRESERVATIVE: Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 4

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
4	Juv. Rainbow Trout				
2	Lamprey Ammocetes				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

Trib 6

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
160501057	Hwy 401 Cobourg	19	Sept	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + JSC			

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	12.3° DO=9.67	530 pH 8.15

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1845-1857 d/s: 1598-1608

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 6	L. ON.		Trib 6

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 739449 E 4876949 N	
TOWNSHIP:	**MNR DISTRICT:** Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river ☐	Channelized ☐	Permanent ☒	Intermittent ☐	Ephemeral ☐	ASSOCIATED WETLAND:

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s): slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other cascade
Percentage of area	100 / 20	60				20
Mean depth wetted (m)	0.1 / 0.1	30-70cm				0.03
Mean width wetted (m)	0.5 / 1.5	1.5-2				1.5
Mean bankfull width (m)	2.5 / 2					1.5
Mean bankfull depth(m)	>0.5 / >0.5	>1m				0.2
Substrate	Si Mu / Si Co	Si Cl				Co Gr Bo

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form Trib 6

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	10			Instream Overhanging		Instream Overhanging	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☒	☐	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
	/	/		
Predominant Species	/	/	watercress speedwell	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	low flow	culvert perched 50 cm

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	yes	watercress u/s + d/s	/

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s – small concrete culvert @ extra point dry into ROW or CT marsh, that drains down embankment to creek
  - lots WC in channel, 1.5 m wide average ~0.1 m deep
  - steep embankments w/ areas of collapse

- d/s – plunge pool, pool/cascade/run sequence
  silt layer over Cl/Sa/Gr

Additional Notes Appended? ☐ No ☐ Yes number of pages ________

Fish Community Inventory Record Form

Trib 6

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1605001057	Hwy 401	18	Sept	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE + JSC		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 6	
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☑

Length (m):	Settings: 25Hz 200V	Seconds: 162

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☐ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Tab 6

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
2	YOY Brook Trout				
2	Adult Brook Trout				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

Trib #7

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1165-201057	Hwy 401	18	Sept	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + JSC	hot & sunny		

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	17.5° DO: 7.01	499 pH 8.11

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1834-1844 d/s: 1609-1616

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 7	L. ON.	—	Trib. 7

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 261790 E 4877676 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2 1.8m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☐	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
	mod.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	100		100			
Mean depth wetted (m)	0.05-0.1		5-9cm			
Mean width wetted (m)	0.6-1.2		1.5-2			
Mean bankfull width (m)	2		2.5			
Mean bankfull depth(m)	>0.3		>0.3			
Substrate	Co Gr Sa		Co			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Tnb 87

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☑	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	/	10	Instream Overhanging 10	/	Instream / Overhanging /	80

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☒ u/s	☒ d/s	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	/	/	watercress u/s+d/s	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		low flow in Co	

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Yes trout	watercress d/s. u/s	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- shallow run area Co/Gr/Sa under cedars, WC @ edge of cedars u/s from culvert
  0.6 - 1.2 m wide

- d/s- cobble riffle blw culvert + Row + beyond shallow & slow

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 7

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650010057	Hwy 401	8	Sept	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE & JSC		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐
hot & sunny				

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 7	
TOWNSHIP:	**MNR DISTRICT:** Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒

Length (m):	Settings: 25 Hz 200 V	Seconds: 101

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☒ No	# OF BAGS	PRESERVATIVE: Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	**SCIENTIFIC NAME / COMMON NAME**	**PHYSICAL CONDITION**		**TOP PREDATOR**	
		# fish with blackspot	**# fish with lesions, tumours, maturity etc.**	**Length (mm) F= total fork or L = total length**	**AGE CLASS YOY / Adult**
1	Blacknose Dace				
1	Trout observed, missed netting				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

shelter valley

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1652010577	Hwy 401	19	Sept.	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE JSC JM	sunny, 24°C		

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):

PHOTO NUMBERS AND DESCRIPTIONS: 1714 - 1770

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Shelter Valley Creek	L. ON.	—	Shelter Valley

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 260560 E 4877535N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Forest	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☒ Describe: Arched concrete — Size (w x h) m²: 15 m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
4US + DS	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m): 40 4US 100 DS — CURRENT VELOCITY (m/s): fast

SUB-SECTION(S)	Run ☐	Pool ☐ scour	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	>0 / 45	5	30 / 50			
Mean depth wetted (m)	0.3-0.6 / 0.2-0.6	1	0.2 / 0.2			
Mean width wetted (m)	6-8 / 6-8	6	8 / 6			
Mean bankfull width (m)	10 / 10	10	10 / 10			
Mean bankfull depth(m)	1m / 1m	>1m	1 / 1m			
Substrate	Co Bo G / Co Sa Gr	Cl	Bo Co / Co Gr Bo			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Shelter Valley

Watercourse Field Record Form

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☑	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	5	20	30	Instream 5 Overhanging	/	Instream / Overhanging	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☑	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	/	/	/	0

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	/	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Salmon + Trout	Fe stain	/

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- uls - riffle/run over Co/Bo/Gr

- dls - large riffle over Co/Bo/Gr, transitions to run over Co/Sa/Gr
- scar pool @ dls bend in river
- many chinook observed uls & dls.

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Shelter Valley

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
165001057	Hwy 401	19	Sept	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
Katie Easterling, Jackie Metcalfe, Jess Sosa Campos		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
sunny, 24°C	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
Shelter Valley Creek	downstream of Hwy 401
TOWNSHIP:	**MNR DISTRICT:** Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW		24°C	8.39	11.27	15.8	483.4

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☑

Length (m):	Settings: 30 Hz, 200 V	Seconds: 614

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☑ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Shelter Valley

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	**SCIENTIFIC NAME / COMMON NAME**	**PHYSICAL CONDITION**		**TOP PREDATOR**	
		# fish with blackspot	**# fish with lesions, tumours, maturity etc.**	**Length (mm) F= total fork or L = total length**	**AGE CLASS YOY / Adult**
XX	mottled sculpin				
:	crayfish				
X	Rainbow Trout YOY + Juv.				
°	Lamprey (ameocyte)				
12	observed Chinook salmon - adults				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Trib 8

Watercourse Field Record Form

GENERAL INFORMATION				
PROJECT #: 165001057	PROJECT DESCRIPTION: Hwy 401	DAY: 19	MONTH: Sept	YEAR: 2017
Is STREAM REALIGNMENT required for this section: O Yes O No Ø-Unknown				
COLLECTORS: KE + JSC	WEATHER CONDITIONS: hot & sunny	TIME STARTED:	TIME FINISHED:	
AIR TEMP: 24 °C	WATER TEMP: dry	CONDUCTIVITY (µS/cm):		
PHOTO NUMBERS AND DESCRIPTIONS: 1771 - 1784				

LOCATION			
NAME OF WATERBODY: unnamed Trib.8	DRAINAGE SYSTEM: L. ON.	CROSSING #: —	STATION #: Trib 8
LOCATION OF CROSSING: Vernonville Rd & 401			
UTM ZONE, EASTING & NORTHING: 17T 262074 E 4877712N		MTO CHAINAGE: —	
TOWNSHIP: —		MNR DISTRICT: Peterborough.	

LAND USE AND POLLUTION	
SURROUNDING LAND USE: rural	SOURCES OF POLLUTION: run-off

EXISTING STRUCTURE TYPE				
Bridge O	Box Culvert O	Open Foot Culvert O	CSP Ø	N/A O
Other O Describe:			Size (w x h) m^2	

SECTION TYPE AND MORPHOLOGY							
SECTION IDENTIFIER: u/s & d/s		SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:	
	O	O	O	Ø	O		
TOTAL SECTION LENGTH (m): —				CURRENT VELOCITY (m/s): dry			

SUB-SECTION(S)	Run	Pool	Riffle	Flats	Inside culvert	Other
	O	O	O	O	O	
Percentage of area						
Mean depth wetted (m)				dry		
Mean width wetted (m)						
Mean bankfull width (m)						
Mean bankfull depth(m)						
Substrate						

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Tnb 8

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	0	0	0	0
Right Upstream Bank	0	0	0	0

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	/	/	Instream / Overhanging	/	Instream 90 / Overhanging 5	5

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	0	0	0	0	0

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
			100	
Predominant Species	/	/	grasses + sedges CT	0

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		dry	

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	/	/	—

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

-u/s - dry channel to catch basin, cobble @ basin

-d/s - bF = 2.2m, dry grass + sedge + CT lined

west side u/s no channel, dry, catch basin
d/s - small pool @ culvert ~ 1m wide + 0.03m (too little to fish) + dry 3m
d/s - grassed, CT lined

Additional Notes Appended? O No O Yes number of pages _____

Watercourse Field Record Form

Trib 9

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1165001057	Hwy 401	18	Sept	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☑ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE + JSC	hot + sunny		

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	17.1° DO = 6.94	425 pH 8.12

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1817-1830 d/s: 1617-1628

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Unnamed Trib. 9	L. ON.	—	Trib 9

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 263320 E 4877873 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
AG	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☑	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: | Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☑	☐	☑	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s): Fast.

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area		60	100 / 40			
Mean depth wetted (m)		0.8	0.1-0.2 / 0.1			
Mean width wetted (m)		5	3 / 3			
Mean bankfull width (m)		5.5	3.5 / 3.5			
Mean bankfull depth(m)		>1m	>0.4 / >0.3			
Substrate		Co Sa Si	CO BO Sa / CO Gr			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 9

BANK STABILITY	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☒	☐	☐
Right Upstream Bank	☐	☒	☐	☐

HABITAT								
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream 2 Overhanging 3	Organic debris	Vascular Macrophytes Instream Overhanging	None
	✓	10	10		✓	✓	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	✓	✓	✓	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	✓	–	✓

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	yes	Fe stain d/s right	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - large riffle beyond ROW fence + d/s to culvert over Ba/Co/Sa substrates
  - undercut bank u/s right side
  - small cascade over large rock @ fence
  - side channel ~~not~~ lots of erosion u/s bo/co substrates - located beyond ROW
- d/s - large deep pool with lots of trout, suckers + creek chub. transitions to shallow riffle beyond ROW + fence + through cedar bush

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 9

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1653001057	Hwy 401	18	Sept.	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE & JSC		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐
hot & sunny				

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 9	
TOWNSHIP:	**MNR DISTRICT:** Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒

Length (m):	Settings: 30Hz & 150 V	Seconds: 103 s

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☒ No	# OF BAGS	PRESERVATIVE:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 9

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
	Brook Trout				
	White Sucker				
	Creek Chub				
	Blacknose Dace				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

Trib 10

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1685001057	Cobourg	18	Sept.	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☐ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE JSC	hot & sunny		

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	18.1 DO 6.70	440 pH 8.28

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1807-1816 d/s: 1629-1639

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 10	L. ON.	—	Trib 10

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 263515 E 4877898 N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Ag	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: | Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
d/s + d/s.	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☐	☒	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
30 m	

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other standing
Percentage of area		20 / 80		80		~~20~~ / 20
Mean depth wetted (m)		0.05 / 0.5-0.7		0.2		0.1-0.2
Mean width wetted (m)		1-1.5 / 5		0.6		1.5
Mean bankfull width (m)		3-4 / 5		0.6		2
Mean bankfull depth(m)		0.4 / 1m		0.6		0.5
Substrate		si mu / si mu		si mu		si mu

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 10.

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☑	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	/	/	Instream / Overhanging /	/	Instream / Overhanging 60	40

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☑	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
			10	
Predominant Species	/		watercress d/s of CT bullrush	90

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		watercress d/s of fence	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

-u/s- retain ash tree

↳ watercress u/s ~3m from culvert

meander

COMMENTS:

-u/s- narrow flat through grassy ROW to pool @ culvert, si/mu substrate

-d/s - altered, rectangle pool @ culvert, narrow channel flows south under fence & west outside ROW.
-soft, muck substrate

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 10

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1685001057	Hwy 401	18	Sept	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE + JSC		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐
hot + sunny				

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
Unnamed Tributary 10	
TOWNSHIP:	**MNR DISTRICT:** Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒

Length (m):	Settings: 30 Hz 150 V	Seconds: 106

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☒ No	# OF BAGS	PRESERVATIVE: Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

No Catch

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
	No Catch				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

Trib 11

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16500105 7	Hwy 401	19	Sept.	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & JSC	hot + sunny	8:40	

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	dry	

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1797-1806 d/s: 1670-1676

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 11	L. ON.	—	Trib 11

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 263892 E 4877946N	—
TOWNSHIP: —	MNR DISTRICT: Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: Size (w x h) m^2 1.5 m

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s.	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☐	☐	☐	☒	☐	CT

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
	dry

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area						
Mean depth wetted (m)						
Mean width wetted (m)				dry		
Mean bankfull width (m)						
Mean bankfull depth(m)						
Substrate						

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 11

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☒	☐	☐	☐
Right Upstream Bank	☒	☐	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
				Instream Overhanging		Instream 100 Overhanging	0

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☒ u/s	☐	☐	☒ d/s	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
			100	
Predominant Species			CT	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		dry	

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - dry flow path ~ 1.5m BF, silt/mud
  - dense cedar bush
  - standing water in culvert - 1-2cm
  - side drainage dry from east side NFH - 50cm drop to culvert
- d/s - CT marsh (dry) @ culvert & in ROW
  - channel beyond ROW dry with CT

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Watercourse Field Record Form

Trib 12

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1165001057	Hwy 401	19	Sept	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & JSC	hot & sunny		

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	15.7 DO: 7.89	561 pH 8.49

PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1785-1796 d/s: 1677-1688

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 12	L. ON.	—	Trib 12

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 264988 E 4878088 N	—
TOWNSHIP: —	**MNR DISTRICT:** Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
mixed forest	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: | Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s & d/s	

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	☒	☐	☒	☐	☐	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
	slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	70 / 10	90	30			
Mean depth wetted (m)	0.1 / 0.1	0.5	0.05			
Mean width wetted (m)	1-2 / 1.5	4	0.6-1.5			
Mean bankfull width (m)	2.5 / 2	5	2.1			
Mean bankfull depth(m)	0.5 / >0.5	>1m	0.5+			
Substrate	Sa Gr. / Co Sa Co Br.	Sa D	Gr Fr			

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 12

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☑	☐	☐
Right Upstream Bank	☐	☑	☐	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	/	5	Instream 5 Overhanging 10	/	Instream Overhanging /	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☒	☐	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	/	/	/	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	/	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Yes trout	Fe d/s	/

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

-u/s- run/riffle sequence 1-2m over co/Gr/Sa

-d/s- pool @ culvert, lots of fish observed in pool

* side drainage u/s eroded channel east & west side. East side drains down slope & into wetland, which may drain into u/s reach beyond ROW - dry.
westside down embankment to creek - dry

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 12

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
165001057	HWY 401	19	09	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
Katie Easterling & Jess Sosa Campos	9:15	9:30

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
cloudy, & hot	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 12	
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☑

Length (m):	Settings:	Seconds:
5m	30Hz, 150V	70

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT? ☐ Yes ☑ No	# OF BAGS	PRESERVATIVE: Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 12

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	SCIENTIFIC NAME / COMMON NAME	PHYSICAL CONDITION		TOP PREDATOR	
		# fish with blackspot	# fish with lesions, tumours, maturity etc.	Length (mm) F= total fork or L = total length	AGE CLASS YOY / Adult
	Fathead minnow	—			
	Brook trout	—			
	Creek chub	—			
	observed at least 12 Brook trout & 12 Creek chub				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages

Watercourse Field Record Form

Trib 13

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
16S001057	Hwy 401	19	Sept.	2017

Is STREAM REALIGNMENT required for this section:
☐ Yes ☐ No ☒ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
KE & JSC	hot & sunny		

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
	14.9 DO = 7.43	1074 pH = 8.05

PHOTO NUMBERS AND DESCRIPTIONS: 1931-1934, u/s: 1711-1713, d/s: 1689-1710 & 1831-1833

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
unnamed Trib. 13	L. ON,	—	Trib 13

LOCATION OF CROSSING:

UTM ZONE, EASTING & NORTHING:	MTO CHAINAGE:
17T 267367 E 4878575N	—
TOWNSHIP: —	**MNR DISTRICT:** Peterborough

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
township cemetery highway.	run-off

EXISTING STRUCTURE TYPE

Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐

Other ☐ Describe: | Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)
u/s + d/s.	

TYPE:	Stream / river ☐	Channelized ☐	Permanent ☒	Intermittent ☐	Ephemeral ☐	ASSOCIATED WETLAND:
						CT d/s of interchange

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):
10m u/s 150 d/s	slow

SUB-SECTION(S)	Run ☐	Pool ☐	Riffle ☐	Flats ☐	Inside culvert ☐	Other
Percentage of area	dry / 80	dry / 10				
Mean depth wetted (m)	5-10cm	0.7				
Mean width wetted (m)	10.6-1	3.5				
Mean bankfull width (m)	1-1.5	3.5				
Mean bankfull depth(m)	0.4	>1m				
Substrate	Co sa Gr	sa Gr.				

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Trib 13

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	☐	☐	☒	☐
Right Upstream Bank	☐	☐	☒	☐

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	10		10	Instream 5 Overhanging 5	/	Instream 5 Overhanging 5	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	☐	☐	☒	☐	☐

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
	/	/	5	
Predominant Species	-	/	speedwell	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	/	0.7m drop off concrete ledge

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		/	/

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - dry
  - possible roadside drainage contribution, flow
  - minimal water in highway ditch, possible groundwater inputs.

- d/s - concrete ledge from Hwy culvert ~8m, then 70cm drop into plunge pool
  - narrow channel 0.6-1m wide w/ cobble/boulder substrates & 5-10 cm flow to interchange culvert

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib 13

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
1650010557	Hwy 401	19	Sept	2017

COLLECTORS:	TIME STARTED:	TIME FINISHED:
KE + JSC		

WEATHER CONDITIONS:	SURFACE CONDITIONS (if applicable):			
hot + sunny	Calm ☐	Rippled ☐	Wavy ☐	Rough ☐

GENERAL LOCATION

NAME OF WATERBODY:	LOCATION OF STATION:
unnamed Trib. 13.	
TOWNSHIP:	MNR DISTRICT: Peterborough

SAMPLING LOCATIONS AND WATER CHEMISTRY

LOCATION:	LENGTH (m)	AIR TEMP. (°C)	pH	DISSOLVED OXYGEN (mg/L)	WATER TEMP (°C)	CONDUCTIVITY (µS/cm)
Upstream						
Downstream						
Culvert / Hwy ROW						

WATER COLOUR:	Colourless ☐	Yellow/brown ☐	Blue/green ☐	Turbid ☐	Other ☐

GEAR

ELECTROFISHER: ☒

Length (m):	Settings: 30Hz 250V	Seconds: 265

NETS and TRAPS:

MINNOW TRAP: ☐ #	DIP NET ☐	TRAP NET ☐
SEINE: ☐	GILL ☐	OTHER ☐ specify

HAULS (#):	Period Of Time (24 hour clock):	
	Set Time	Clear time
LENGTH (m):	MESH SIZE:	DEPTH OF CAPTURE:
	Smallest (cm):	Minimum (m):
	Largest (cm):	Maximum (m):

SAMPLE COLLECTION

FISH KEPT?	# OF BAGS	PRESERVATIVE:			
☐ Yes ☒ No		Formalin ☐	Frozen ☐	Alcohol ☐	Other ☐

COMMENTS:

Additional Notes Appended? ☐ No ☐ Yes number of pages _____

Fish Community Inventory Record Form

Trib L3

CAPTURE INFORMATION					
PROJECT NO.:		**STATION NO.:**			
NO.	**SCIENTIFIC NAME / COMMON NAME**	**PHYSICAL CONDITION**		**TOP PREDATOR**	
		# fish with blackspot	**# fish with lesions, tumours, maturity etc.**	**Length (mm) F= total fork or L = total length**	**AGE CLASS YOY / Adult**
☐	Blacknose Dace				
☒ ☐	Creek Chub				
	N. Redbelly Dace				

Circle number if a sample was kept

PAGE _____ of _____ Number all pages