

**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



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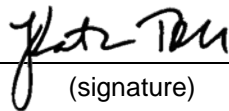
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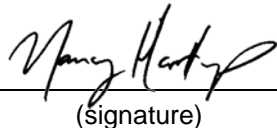
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Introduction
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1.0 INTRODUCTION

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).

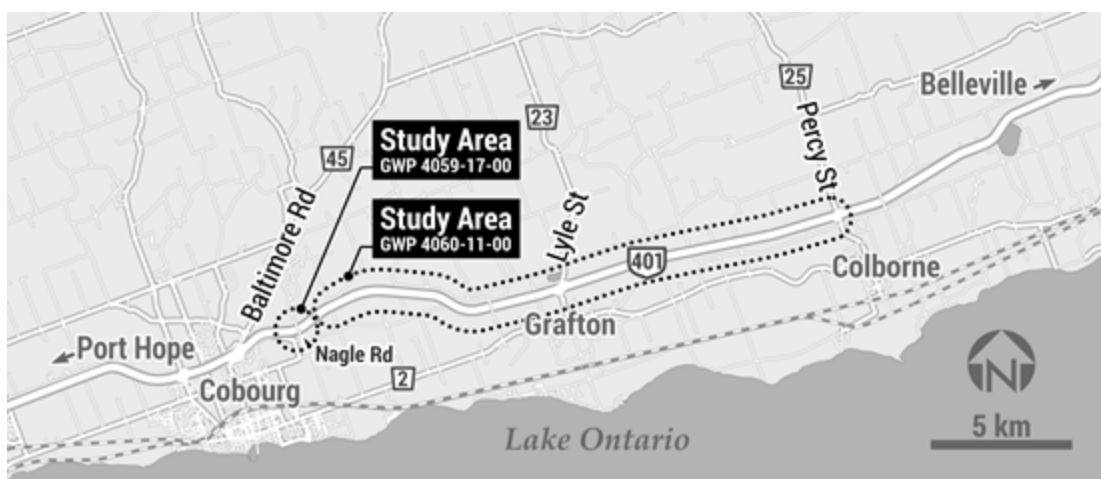


Figure 1: Location of Study Areas

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Methods

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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.

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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.

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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 atromaculatus*) and Blacknose Dace (*Rhinichthys atratulus*).

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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

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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

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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 ammocete 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**).

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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.

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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**).

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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: <i>Juncus</i> , 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)

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Existing Conditions November 9, 2018											
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 <i>Phragmites</i>	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)

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)

Existing Conditions
November 9, 2018

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)

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)

Existing Conditions
November 9, 2018

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)

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Existing Conditions
November 9, 2018

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)

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Existing Conditions
November 9, 2018

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)

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)

Existing Conditions
November 9, 2018

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

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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)

Existing Conditions
November 9, 2018

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

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)

Existing Conditions

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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

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)

Constraints and Opportunities
November 9, 2018

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).

**FISH AND FISH HABITAT EXISTING CONDITIONS REPORT - HIGHWAY 401 PLANNING STUDY
FROM COBOURG TO COLBORNE (GWP 4060-11-00) AND HIGHWAY 401 NAGLE ROAD
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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.

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Summary

November 9, 2018

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.

**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)**

Summary

November 9, 2018

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**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)**

6.0 REFERENCES

- Canadian Council of Ministers of the Environment (CCME). 1999. Canadian water quality guidelines for the protection of aquatic life: Dissolved oxygen (freshwater). In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.
- Fisheries and Oceans Canada (DFO). 2018. Aquatic Species at Risk Mapping. Available at: <http://www.dfo-mpo.gc.ca/species-especes/fpp-ppp/index-eng.htm>. Accessed February 2018.
- MacGregor, R., J. Casselman, L. Greig, J. Dettmers, W. A. Allen, L. McDermott, and T. Haxton. 2013. Recovery Strategy for the American Eel (*Anguilla rostrata*) in Ontario. Ontario Recovery Strategy Series. Prepared for Ontario Ministry of Natural Resources, Peterborough, Ontario. x + 119 pp.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2017. Correspondence between Julie Formsma (Fish & Wildlife Technical Specialist, MNRF) and Katie Easterling (Aquatic Ecologist, Stantec). June 5, 2017.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2018a. Land Information Ontario database. Available online: <http://mnr.gov.on.ca/MNR/en/Business/LIO/>.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2018b. Natural Heritage Information Centre (NHIC) Biodiversity Explorer database. Available online: <http://nhic.mnr.gov.on.ca/MNR/nhic/species.cfm>.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2018c. Constructed Drains digital dataset. Distributed and updated continuously by Land Information Ontario.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2018d. Correspondence between Henry Penyk (Land Use Planning Assistant, MNRF) and Nevena Gazibara (Environmental Planner, Stantec). June 6, 2018.
- Ontario Ministry of Natural Resources and Forestry (MNRF). 2018e. Correspondence between Phil Prell (Resource Management Technical Specialist, MNRF) and Nevena Gazibara (Environmental Planner, Stantec). September 4, 2018.
- Ontario Ministry of Transportation (MTO). 2009. Environmental Guide for Fish and Fish Habitat. Version June 2009. Provincial and Environmental Planning Office, St. Catharines, Ontario. The Queen's Printer for Ontario.
- Ontario Ministry of Transportation (MTO). 2013. Environmental Reference for Highway Design. Provincial and Environmental Planning Office, St. Catharines, Ontario. The Queen's Printer for Ontario.
- Stantec Consulting Ltd. (Stantec). 2018. Draft Terrestrial Ecosystems Existing Conditions Report – Preliminary Design and Class EA for the Expansion of Highway 401 from Cobourg to Colborne.

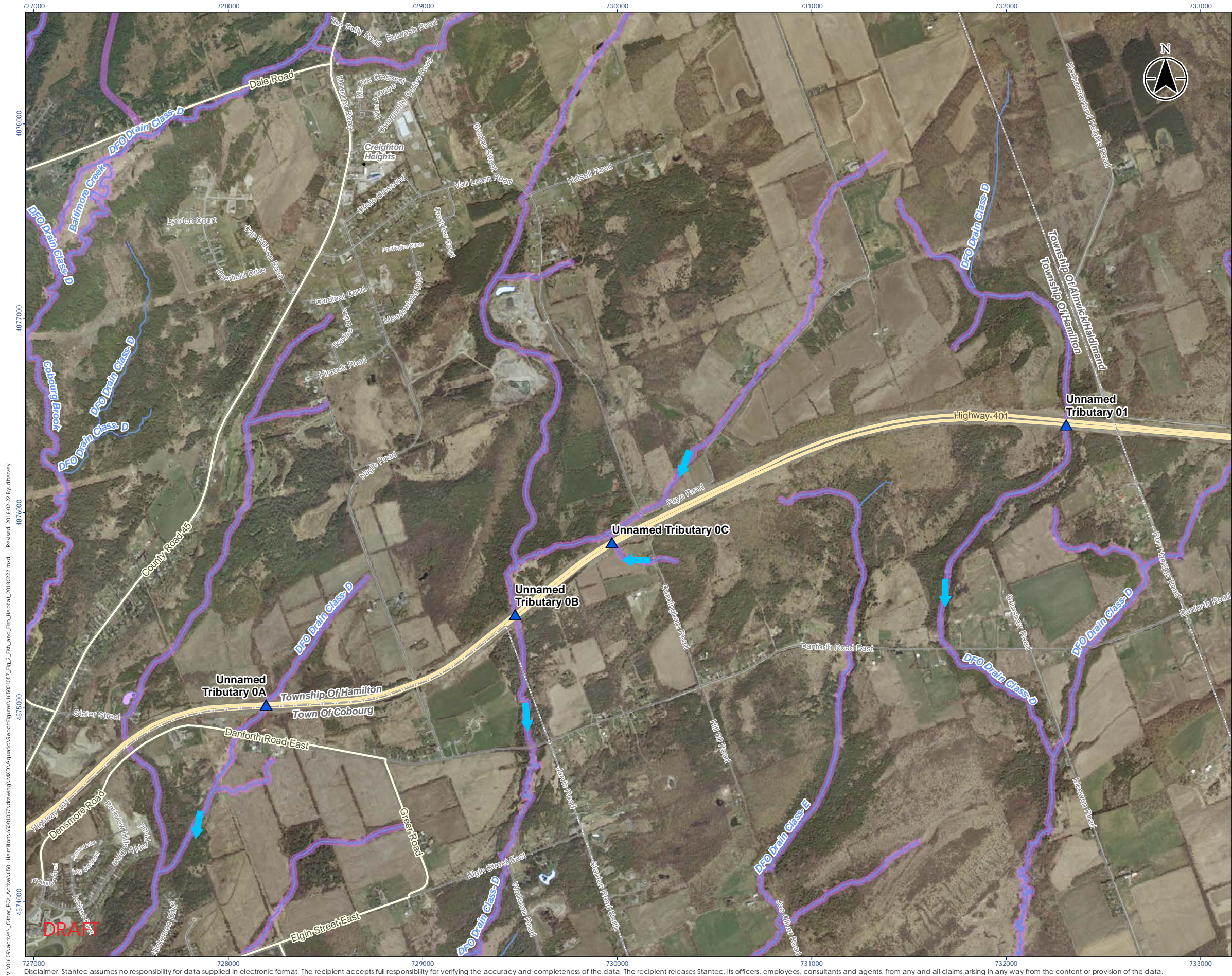
**FISH AND FISH HABITAT EXISTING CONDITIONS REPORT - HIGHWAY 401 PLANNING STUDY
FROM COBOURG TO COLBORNE (GWP 4060-11-00) AND HIGHWAY 401 NAGLE ROAD
INTERCHANGE STUDY (GWP 4059-17-00)**

References

November 9, 2018

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APPENDIX A: FIGURE 2

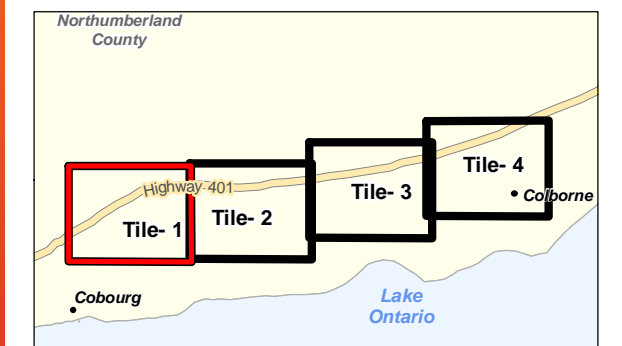


Legend

- 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

0 1 km
1:20,000 (At original document size of 11x17)

- 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. Orthoregistry © First Base Solutions, 2016. Imagery Date, 2008.



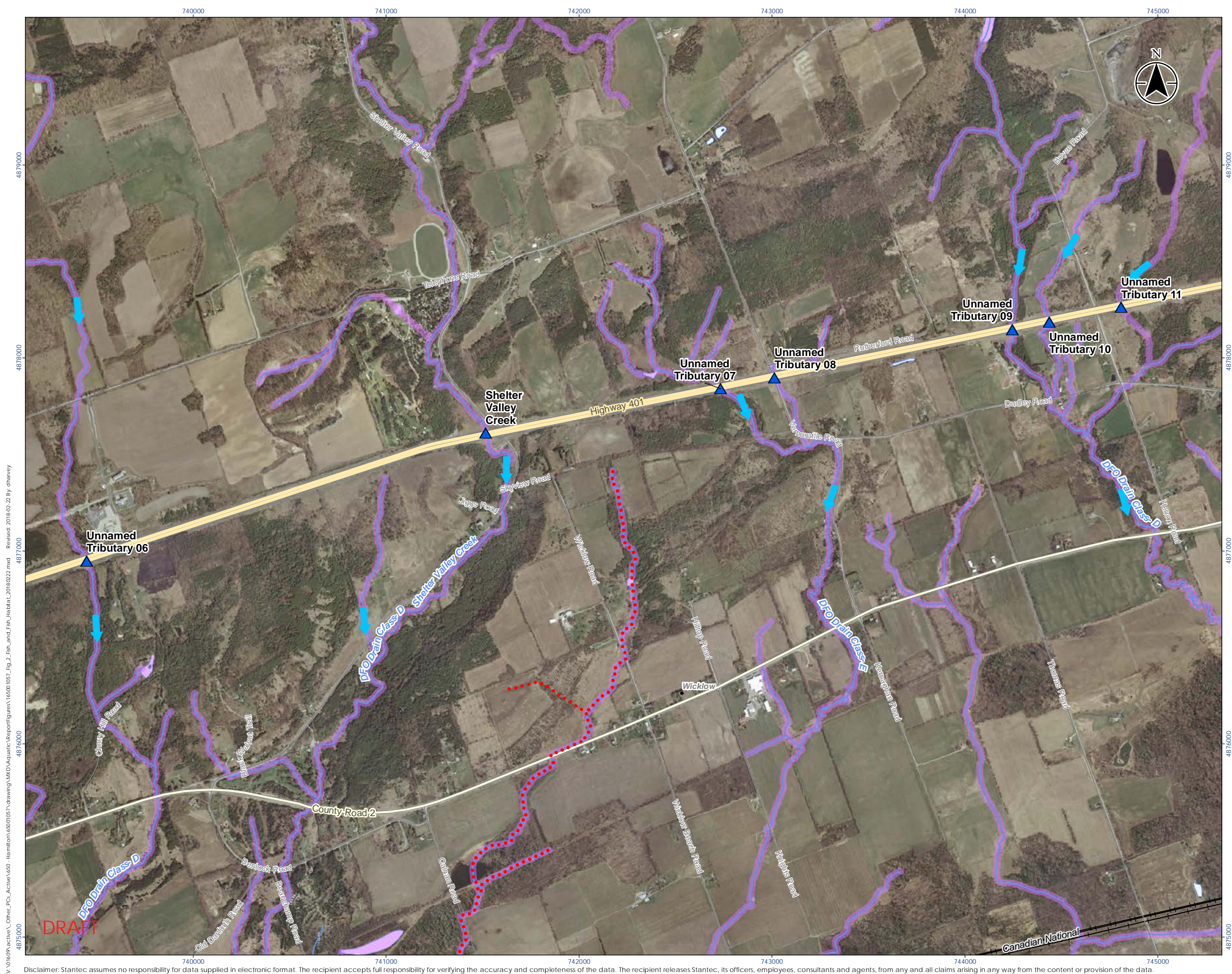
Project Location
Northumberland County

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 PLANNING STUDY FROM
COBOURG TO COLBORNE

Figure No.
2- 1

Title
Fish and Fish Habitat

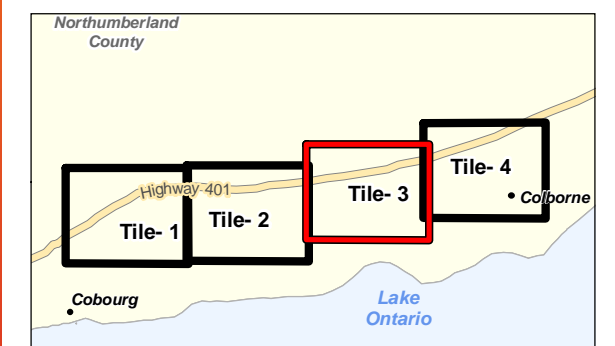


Legend

- 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
1:20,000 (At original document size of 11x17)

- #### Notes
- Coordinate System: NAD 1983 UTM Zone 17N
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 - Orthoregistry © First Base Solutions, 2016. Imagery Date, 2008.

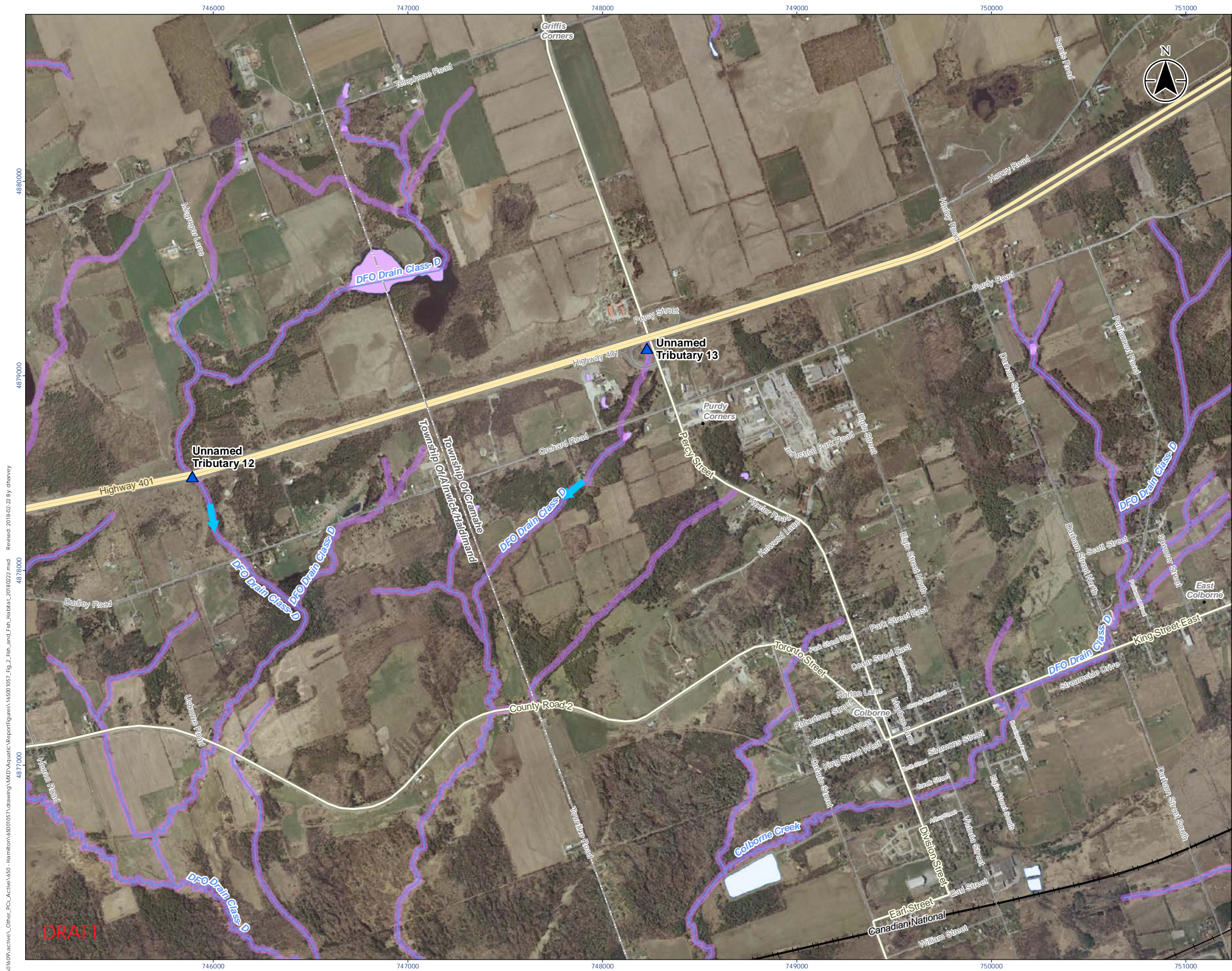


Project Location
Northumberland County
165001057 REVA
Prepared by DH on 2018-02-22
Technical Review by PW on 2018-02-08
Independent Review by ABC on yyyy-mm-dd

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

Figure No.
2- 3

Title
Fish and Fish Habitat



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

1:20,000 (At original document size of 11x17)

Notes

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- Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2016.
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Northumberland
County

165001057 REVA
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Client/Project
ONTARIO MINISTRY OF TRANSPORTATION
HIGHWAY 401 PLANNING STUDY FROM
COBOURG TO COLBORNE

Figure No.
2- 4

Title
Fish and Fish Habitat

APPENDIX B: AGENCY CORRESPONDENCE

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

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 Please consider the environment before printing this email.

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

100-300 Hagey Boulevard, Waterloo ON N2L 0A4

Phone: (519) 575-4111

Cell: (519) 859-8391

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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

Hello Julie,

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Thanks,
Katie

Katie Easterling, B.Sc (Hon)

Aquatic Ecologist
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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,

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Cheers,
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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 MNR above along with other information sources such as species distributions and habitat requirements as well as field visits using MNR 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 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.

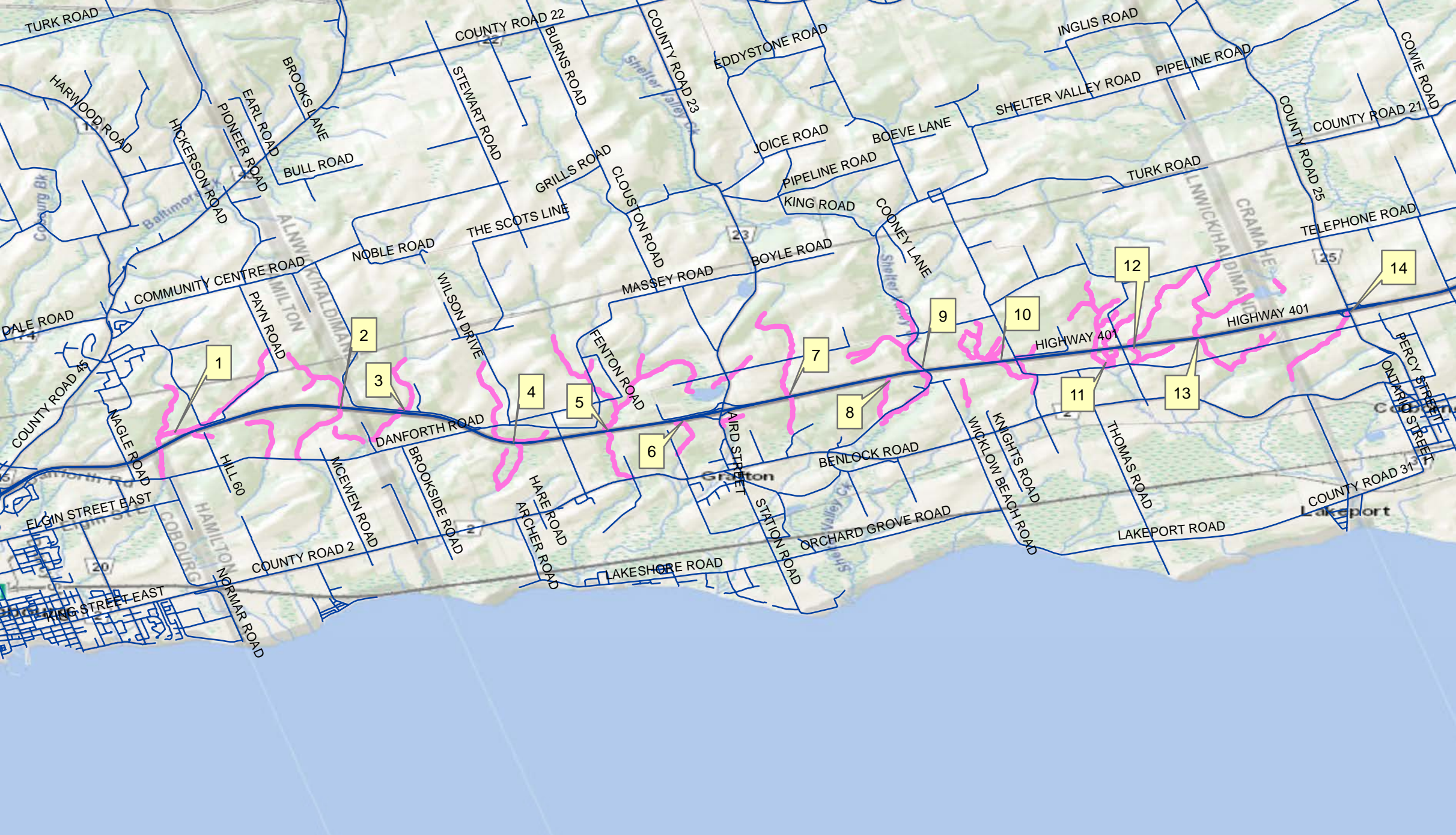
Sincerely,
Henry Penyk

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.



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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/tessellated 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/tessellated 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/tessellated 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/tessellated 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/tessellated 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/tessellated 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/tessellated 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/tessellated 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/tessellated 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/tessellated 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/tessellated 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

*APPENDIX C1:
SPRING (JUNE 2017)*



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.

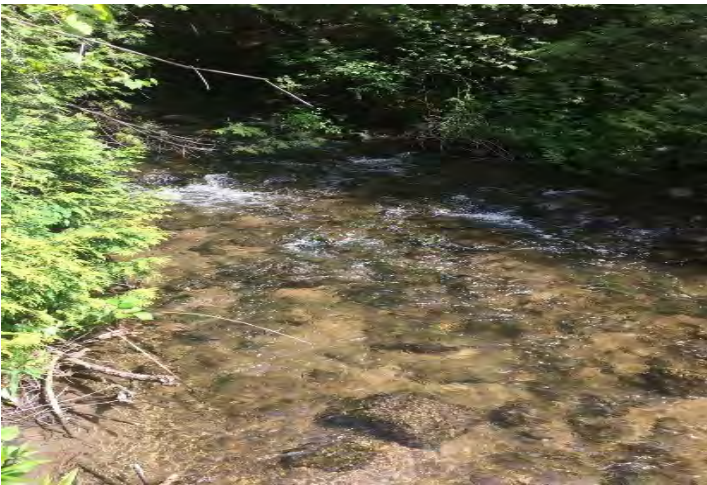


Photo 53: Unnamed Tributary 04 – Facing upstream from culvert.



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.

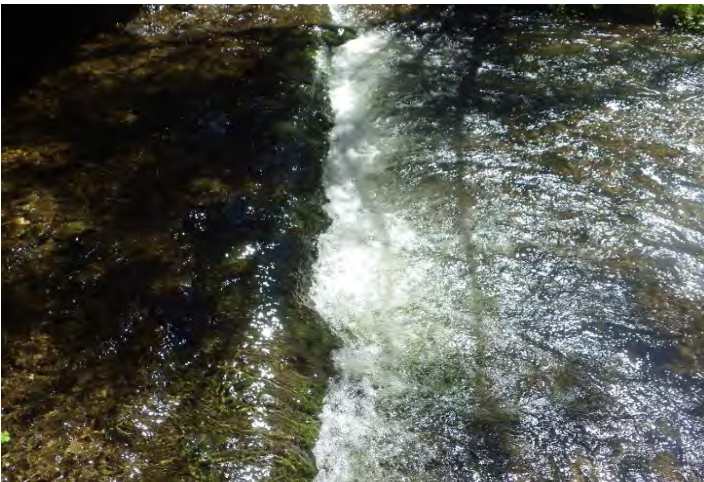


Photo 59: Unnamed Tributary 04 – Concrete lip at culvert outlet.



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.

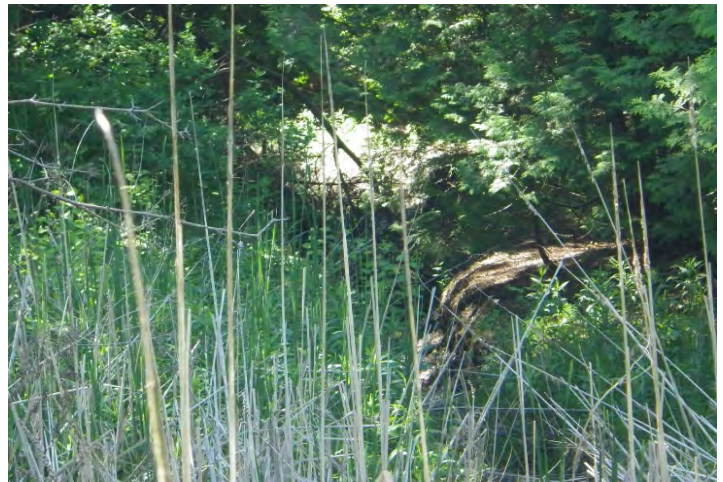


Photo 120: Unnamed Tributary 11 – Facing south from RoW fence showing channelized feature.



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)*



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 watercross.



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.

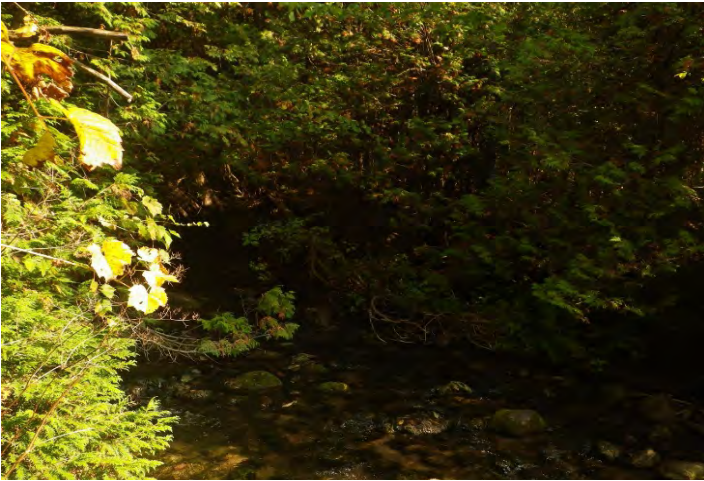


Photo 55: Unnamed Tributary 04 – Facing upstream (north), away from culvert.



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.

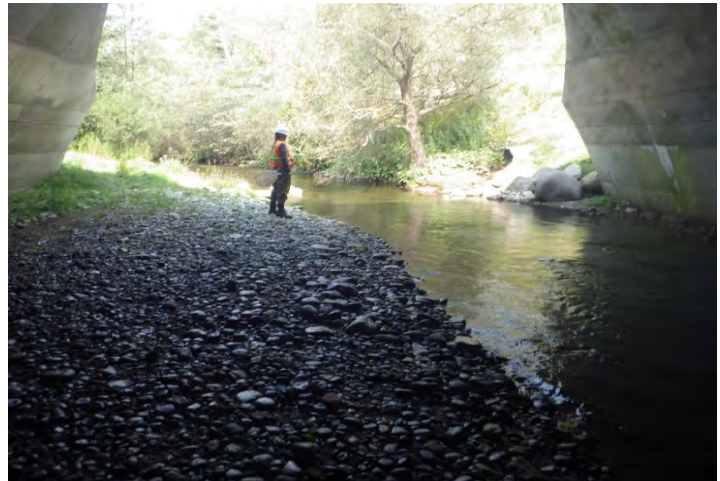


Photo 82: Shelter Valley Creek – Facing upstream through culvert.



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.

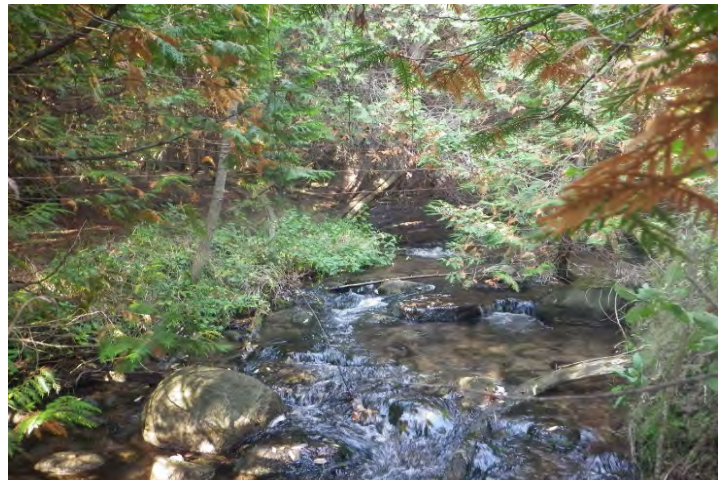


Photo 99: Unnamed Tributary 09 – Facing upstream of main channel from culvert towards RoW fence.



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

*APPENDIX D1:
SPRING (JUNE 2017)*

Watercourse Field Record Form

Trib OA

GENERAL INFORMATION									
PROJECT #: 105001057		PROJECT DESCRIPTION: flow 401		DAY: 12	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & ME		WEATHER CONDITIONS: rain + hot		TIME STARTED: 3 pm		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 17.1°C DO=8.1		CONDUCTIVITY (µS/cm): 461		pH=7.27			
PHOTO NUMBERS AND DESCRIPTIONS: d/s: 1035-1047 u/s: 1071-1088									
LOCATION									
NAME OF WATERBODY: Unnamed Trib OA		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: trib OA			
LOCATION OF CROSSING: east of Nagle Rd.									
UTM ZONE, EASTING & NORTHING: 17T 728196 E 4875011 N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: commercial				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 2545 2545				CURRENT VELOCITY (m/s):					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other cascade			
Percentage of area		15/30	45/70	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 1-1.4	0.4-2					
Mean bankfull width (m)		2 4	5 3	2					
Mean bankfull depth (m)		~1m 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	

Watercourse Field Record Form

0A

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	low flow	cascade for small b/c

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

POTENTIAL ENHANCEMENT OPPORTUNITIES:
Fe u/s

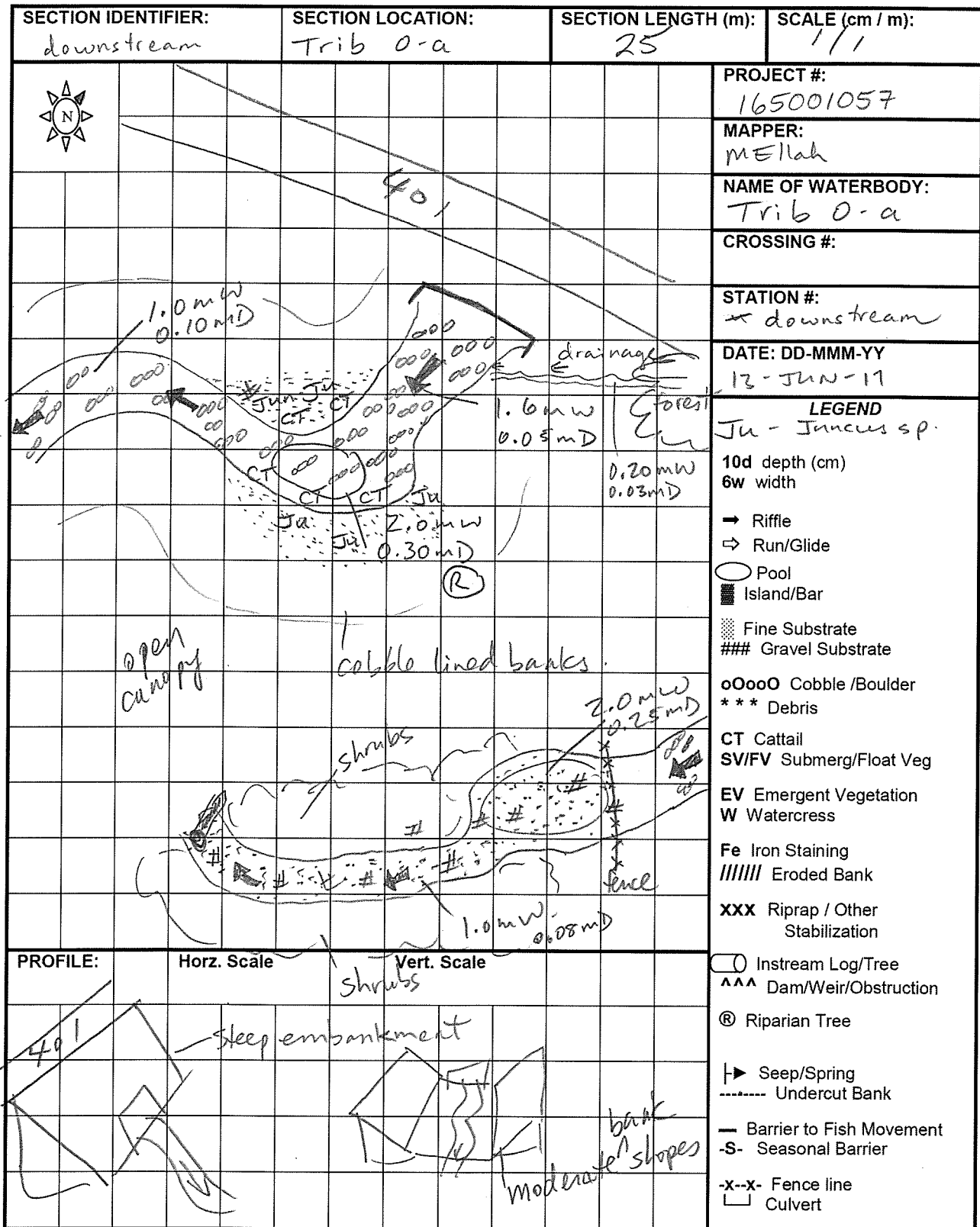
COMMENTS:
- u/s - swamp drainage 0.4-2m wide, flat over Rues - cascade 45cm drop into plunge pool eroded banks & clay substrate - riffle over riverstone to culvert 2.5 x 0.05 - cypinids (likely blackrock) in plunge pool - d/s - cobble lined riffle/pool / riffle/pool 1-1.6m wide & 0.05-0.3m - recently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

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

Trib 0-a

SECTION IDENTIFIER: upstream		SECTION LOCATION: Trib 0-a		SECTION LENGTH (m): 25		SCALE (cm / m): 1/1	
						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	
PROFILE:		Horz. Scale		Vert. Scale			

Trib 0-a



Watercourse Field Record Form

Tab OB

GENERAL INFORMATION									
PROJECT #: 105001057		PROJECT DESCRIPTION: Run 401		DAY: 13	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & MC		WEATHER CONDITIONS: overcast & hot		TIME STARTED: 3:30 pm		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 15.7°C DO = 11.99		CONDUCTIVITY (µS/cm): 448		pH 7.74			
PHOTO NUMBERS AND DESCRIPTIONS: d/s: 1048-1056 u/s: 1057-1070									
LOCATION									
NAME OF WATERBODY: unnamed Trib. OB		DRAINAGE SYSTEM: L.O.N.		CROSSING #: —		STATION #: Tab OB			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 729475 E 4875475 N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: cedar brush					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input checked="" type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 4m.			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s & d/s			SECTION LOCATION: (include on habitat map)						
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 30m u/s + 25m d/s				CURRENT VELOCITY (m/s): mod.					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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 Si Si Sa Gr		Co Gr Si 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 013

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	/	/

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout	Fe @ d/b culvert	deot side

POTENTIAL ENHANCEMENT OPPORTUNITIES:

↑ riparian cover

COMMENTS:


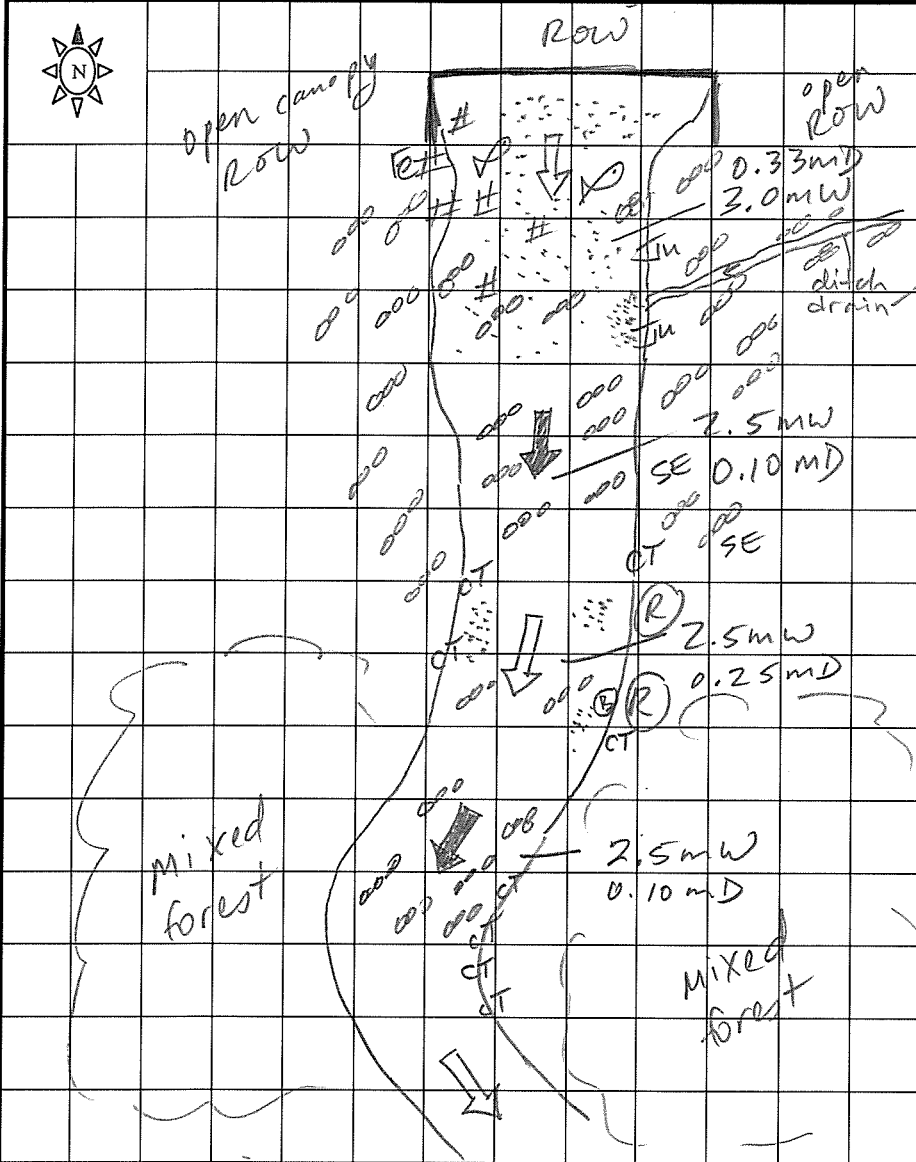
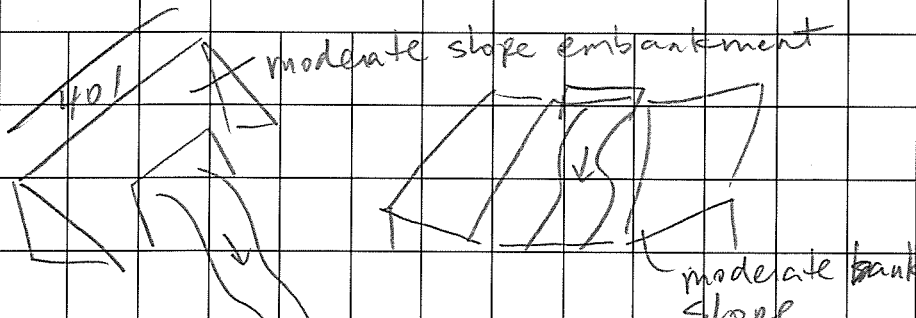
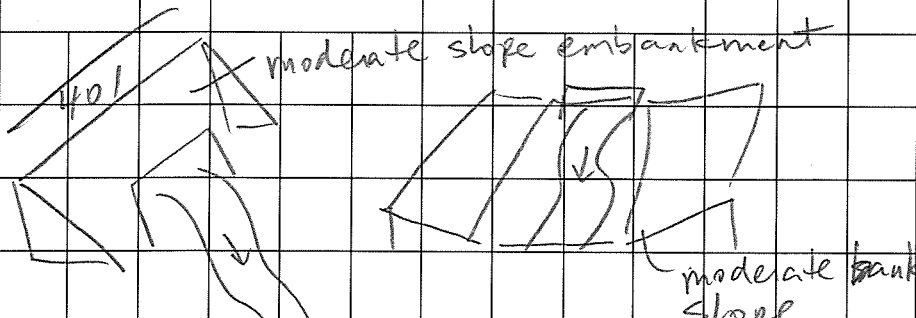
- u/s - unstable, collapsing banks.
- run, riffle @ culvert 2.5m wide 0.3m deep
- beyond row si/sa substrates. overstore @ culvert & BOW
- wetland drainage from west side of culvert
- d/s - cyprinids observed @ culvert
- run/riffle sequence 2.5m + 0.05-0.3m deep
- Gr/co w/ some fines (sa/si)

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

Trib 0-6

SECTION IDENTIFIER: upstream		SECTION LOCATION: Trib 0-6		SECTION LENGTH (m): 40		SCALE (cm / m): 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	
401							
PROFILE:		Horz. Scale		Vert. Scale			
moderate embankment slope							
moderate slope							
bank height 0.2-1.0m							

Trib 0-b

SECTION IDENTIFIER: downstream		SECTION LOCATION: Trib 0-b		SECTION LENGTH (m): 40		SCALE (cm / m): 1 1	
						PROJECT #: 165001057	
						MAPPER: MELLAH	
						NAME OF WATERBODY: Trib 0-b	
						CROSSING #: diffuse flow in ditch	
						STATION #: downstream	
DATE: DD-MMM-YY 13 JUN-17							
PROFILE:		Horz. Scale		Vert. Scale		LEGEND Ju - juncus sp. 10d depth (cm) 6w width SE - sedges sp. → 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 AAA Dam/Weir/Obstruction @ Riparian Tree ▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert	
							
moderate slope embankment		moderate bank slope					

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: 401 Cobourg		DAY: 7	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + ME		WEATHER CONDITIONS: sunny & warm		TIME STARTED: 8:30		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 9.5°		DO = 11.52		CONDUCTIVITY (µS/cm): 345		pH = 8.21	
PHOTO NUMBERS AND DESCRIPTIONS: d/s: 678-696 u/s: 1029-1034									
LOCATION									
NAME OF WATERBODY: unnamed trib 1		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: trib 1			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 732308 E 4876453 N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: cedar forest d/s					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input checked="" type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 25m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER:			SECTION LOCATION: (include on habitat map)						
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): mod.					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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)	2.3	2-3	2 1.0			2			
Mean bankfull width (m)	5	5	3 5			3m			
Mean bankfull depth (m)	0.5	0.4	~0.5m 0.5			0.5m			
Substrate	sa Gr	Gr Sa	Bo Sa Gr ar.			sa Gr			
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

drop
~30m

Watercourse Field Record Form

Trib 1

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input checked="" type="checkbox"/> d/s	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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:

- 4/5- large riffle flowing down gradient over 130 - 2m well or 0.15m deep bank erosion up right side

- dense cedar brush

- ditch drainage both sides trickle down embankment over boulders

- non (G/G) 1/5 - a top of riffle, beyond Row

- d/s- riffle/pool/riffle/pool/run/cascade sequence over gravel & sand, 1-3m wide & 0.15-0.45m deep

- flows into cattail area d/s, beyond Row

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

Fish Community Inventory Record Form

Tab 1


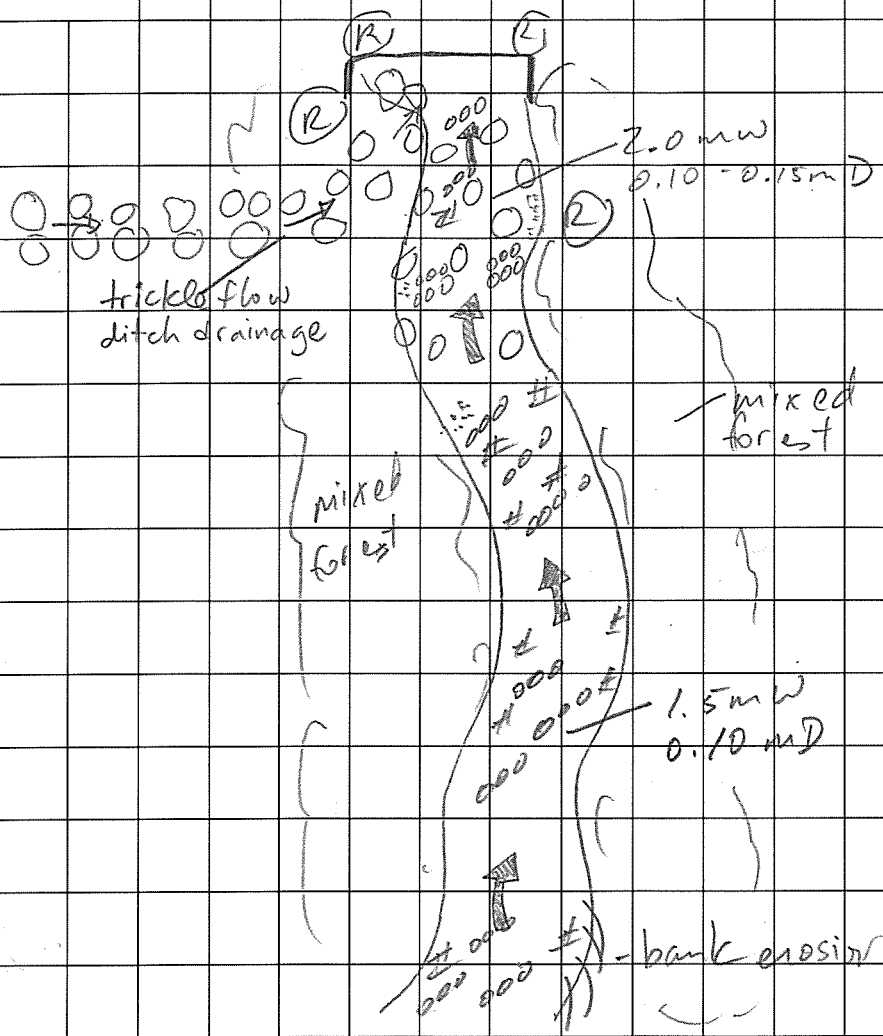
GENERAL INFORMATION						
PROJECT #:	PROJECT DESCRIPTION:		DAY:	MONTH:	YEAR:	
105001057	Hwy 401		14	June	2017	
COLLECTORS:			TIME STARTED:		TIME FINISHED:	
KE & ME			8:30 am			
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
sunny & warm			Calm	Rippled	Wavy	Rough
			0	<input checked="" type="checkbox"/>	0	0
GENERAL LOCATION						
NAME OF WATERBODY:			LOCATION OF STATION:			
unnamed Trib. 1						
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 <input checked="" type="checkbox"/>	Yellow/brown 0	Blue/green 0	Turbid 0	Other 0
GEAR						
ELECTROFISHER: 0						
Length (m):		Settings:		Seconds:		
30 m ⁴¹⁵ ROW		150V 30 Hz		207		
NETS and TRAPS:						
MINNOW TRAP: 0 #		DIP NET 0		TRAP NET 0		
SEINE: 0		GILL 0		OTHER 0 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:			
0 Yes <input checked="" type="checkbox"/> No						
			Formalin 0	Frozen 0	Alcohol 0	Other 0
COMMENTS:						
Additional Notes Appended? 0 No 0 Yes number of pages _____						

Trib

Circle number if a sample was kept

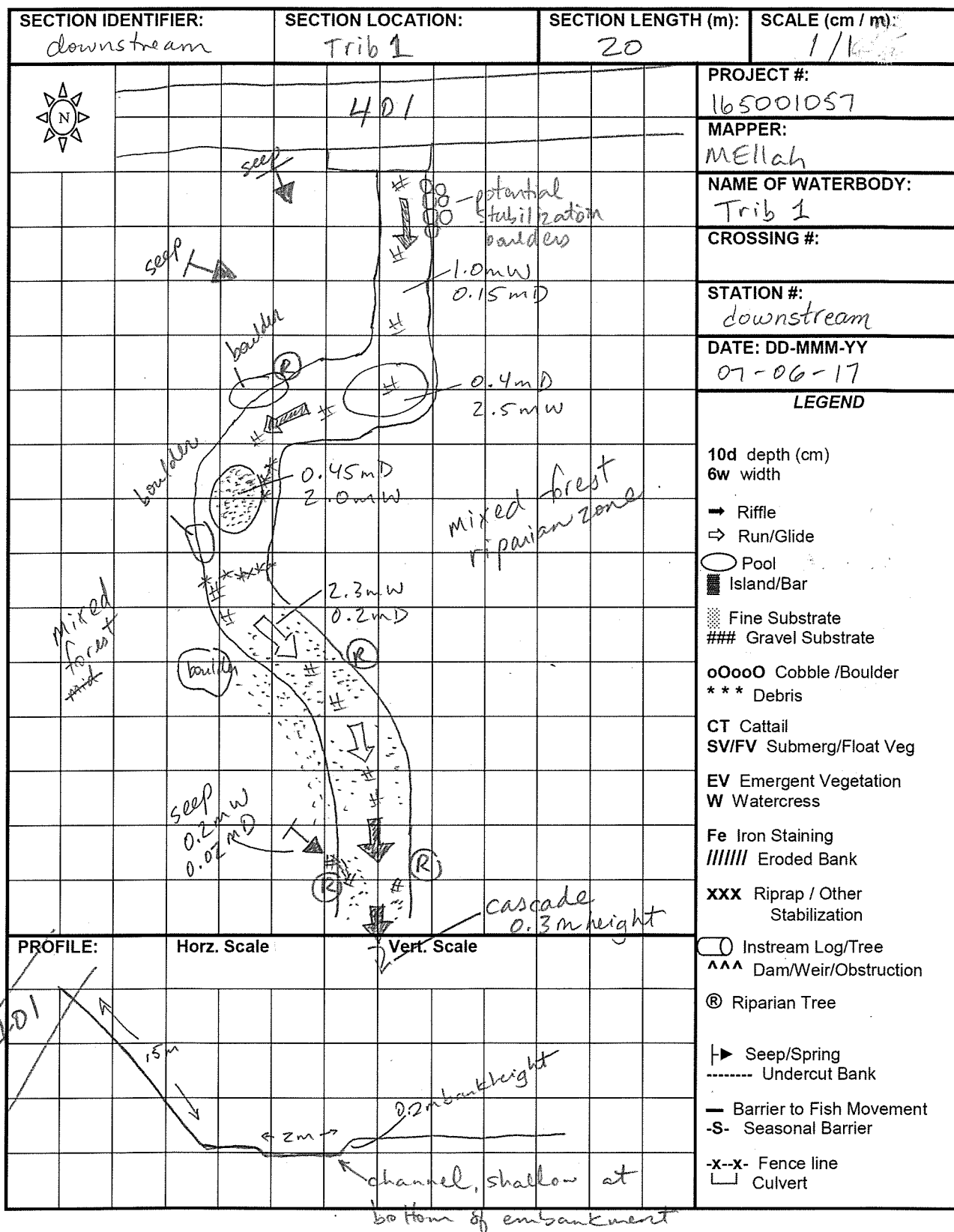
Oct-06

Trib 1

SECTION IDENTIFIER: upstream		SECTION LOCATION: Trib 1		SECTION LENGTH (m): 20		SCALE (cm / m): 1/1	
						PROJECT #: 165001057	
						MAPPER: mellah	
						NAME OF WATERBODY: Trib 1	
						CROSSING #:	
						STATION #: upstream	
DATE: DD-MMM-YY 13-JUN-17							
PROFILE:		Horz. Scale		Vert. Scale		<p>LEGEND</p> <p>10d depth (cm) 6w width</p> <p>➔ 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 AAA Dam/Weir/Obstruction ® Riparian Tree ▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -X-X- Fence line □ Culvert</p>	

banks height
0.2 - 0.5 m

Trib 1



GENERAL INFORMATION									
PROJECT #: 105001057		PROJECT DESCRIPTION: Hwy 401 Cobourg		DAY: 7	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + ME		WEATHER CONDITIONS: sunny & warm		TIME STARTED: 9:25		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 9.1 °C		DO = 11.42		CONDUCTIVITY (µS/cm): 364 pH 8.21			
PHOTO NUMBERS AND DESCRIPTIONS: d/s: 697-715 u/s: 1023-1028									
LOCATION									
NAME OF WATERBODY: Trib 2		DRAINAGE SYSTEM: L. ON.		CROSSING #: —		STATION #: Trib 2			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 733246 E 4876374 N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: mixed forest					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input checked="" type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 3.8 m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s + d/s			SECTION LOCATION: (include on habitat map)						
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: yes CT wetland			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): mod.					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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)	22.5	5	2.5			Row			
Mean bankfull depth (m)	0.6	1.1	0.6			0.5			
Substrate	co Gr	sd Gr	co Gr			simu			
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
umb
Heights

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
	/	/	/

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

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

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

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

Fish Community Inventory Record Form

Trib 2


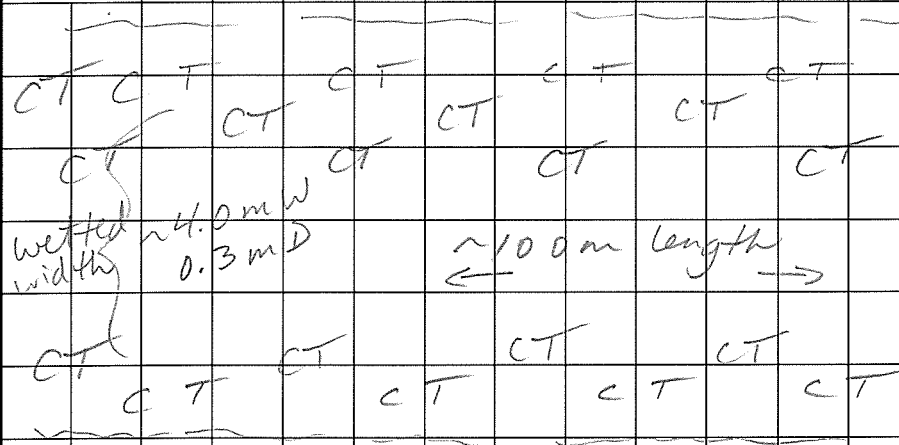
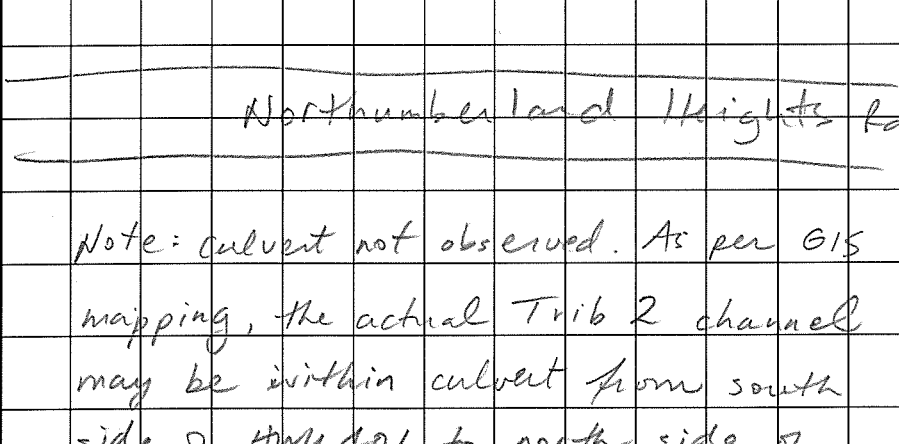
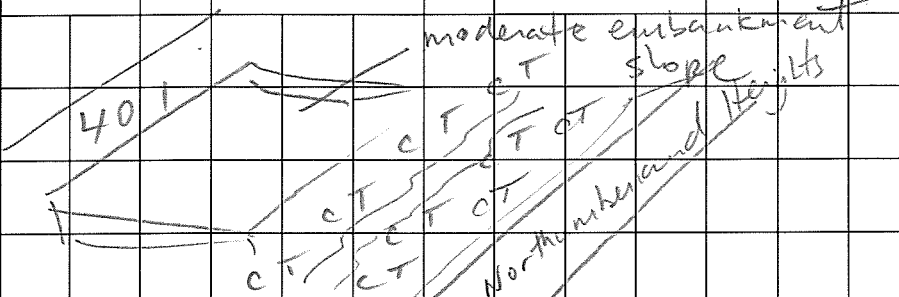
GENERAL INFORMATION						
PROJECT #: 165001057	PROJECT DESCRIPTION: May 401		DAY: 13	MONTH: June	YEAR: 2017	
COLLECTORS: KE & ME			TIME STARTED:		TIME FINISHED:	
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
			Calm <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m): 20 m 4/5 Row		Settings: 200V 30HZ		Seconds: 246 s.		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> No		# OF BAGS		PRESERVATIVE:		
				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>
				Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Tab 2

Circle number if a sample was kept

Oct-06

trib 2

SECTION IDENTIFIER: upstream				SECTION LOCATION: Trib 2				SECTION LENGTH (m): 100				SCALE (cm / m): 1 / 1			
				401								PROJECT #: 165001057			
												MAPPER: Mellah			
								NAME OF WATERBODY: Trib 2							
								CROSSING #:							
wetted width ~4.0m W 0.3m D ~100m length 								STATION #: upstream - Trib 2							
								DATE: DD-MMM-YY 13-JUN-17							
Northumberland Heights Rd.								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							
Note: culvert not observed. As per GIS mapping, the actual Trib 2 channel may be within culvert from south side of Hwy 401 to north side of Northumberland Heights Rd. → NO ACCESS															
PROFILE:				Horz. Scale				Vert. Scale							
															

Trib 2

SECTION IDENTIFIER: downstream		SECTION LOCATION: Trib 2		SECTION LENGTH (m): 20		SCALE (cm / m): 1/1	
						PROJECT #: 165001057	
						MAPPER: MEllah	
						NAME OF WATERBODY: Trib 2	
						CROSSING #:	
						STATION #: Trib 2 - D/S.	
DATE: DD-MMM-YY 07/06/17							
<p>LEGEND</p> <ul style="list-style-type: none"> ✕ Ash 10d depth (cm) 6w width ➔ Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ⋯ Fine Substrate ### Gravel Substrate o o o o 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			

GENERAL INFORMATION								
PROJECT #: 165001057		PROJECT DESCRIPTION: Hwy 401		DAY: 7	MONTH: June	YEAR: 2017		
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown								
COLLECTORS: KE & MB		WEATHER CONDITIONS: Sunny & warm		TIME STARTED: 10:20		TIME FINISHED:		
AIR TEMP:		WATER TEMP: 10.9		DO: 11.3		CONDUCTIVITY (µS/cm): 508		
PHOTO NUMBERS AND DESCRIPTIONS: d/s: 716-742 u/s: 1003-1022								
LOCATION								
NAME OF WATERBODY: trib 3		DRAINAGE SYSTEM: L.O.N.		CROSSING #:		STATION #: trib 3		
LOCATION OF CROSSING:								
UTM ZONE, EASTING & NORTHING: 17T 735157E 4875780N				MTO CHAINAGE:				
TOWNSHIP:				MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION								
SURROUNDING LAND USE: Forest				SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE								
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 1.8		
SECTION TYPE AND MORPHOLOGY								
SECTION IDENTIFIER: u/s & d/s			SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:		
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): mod.				
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other wetland inade		
Percentage of area	90	20	40	50			60	
Mean depth wetted (m)	5-10m	0.35-45	0.05	0.08m			0.05	
Mean width wetted (m)	1	2.2	2	0.9m			2-5	
Mean bankfull width (m)	4	40	2	4.0			5	
Mean bankfull depth (m)	71	71	0.4	71			0.3	
Substrate	cl si co	cl si co	Boco cl si				co Boco	
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

Watercourse Field Record Form

Tab 3.

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
			d/s perched 1 km

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 Ash habs due to obstructions

- remove perched culvert

- retain riparian trees

- channelized feature 400m east along Row ~1m wide 5cm deep over live substrates

- likely barrier to u/s movement due to rip rap + flow drops

COMMENTS:

- u/s - small cattail wetland outer side + constructed drainage u/s rip rap

- dense watercress u/s @ culvert u/s riffle

- 40cm drop from constructed drainage 30cm wide through cattails unlikely Ash habs

- main drainage from east through 1m, 0.5m deep flow path

- d/s - perched culvert 1.6m, plunge pool ~0.4m riffle cascade 0.9 x 8cm deep, small plunge pool + end of 1st riffle, then shallow riffle over c/s/si to Row

- flattens out to 1m run over c/s/si/co along

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

steep eroding bank

- embankment collapsed @ culvert, very unstable

- gradient d/s to Row fence

Fish Community Inventory Record Form

Trib 3

GENERAL INFORMATION						
PROJECT #: 165001057	PROJECT DESCRIPTION: Hwy 401		DAY: 13	MONTH: June	YEAR: 2017	
COLLECTORS: KE & ME			TIME STARTED:		TIME FINISHED:	
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
			Calm <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/> 30 Hz 200 V						
Length (m):		Settings:		Seconds: 1965		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>
				Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Prob 3

Circle number if a sample was kept


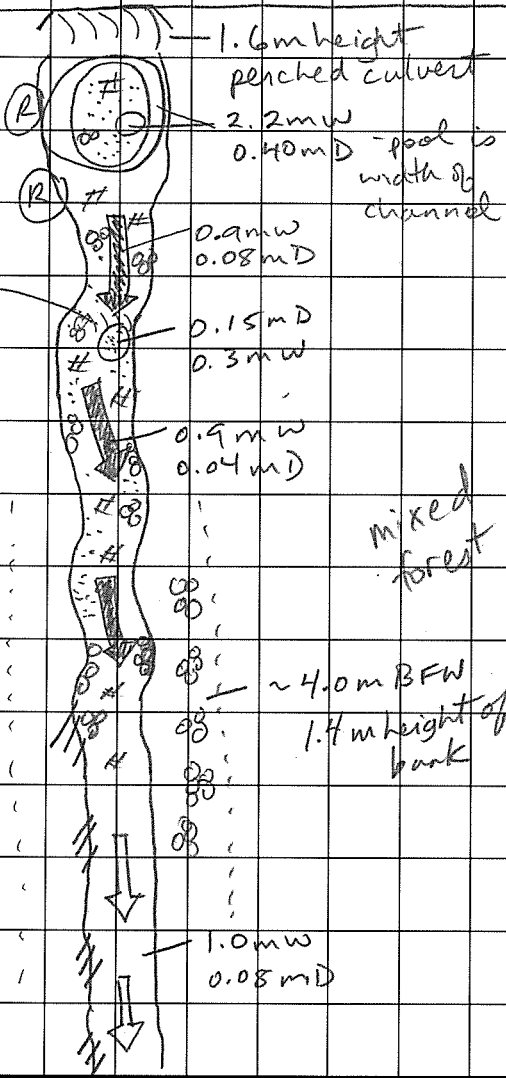
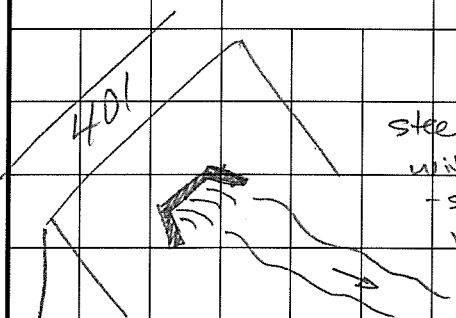
Oct-06

Source CT wetland
170m west

Trib 3

SECTION IDENTIFIER: upstream		SECTION LOCATION: Trib 3		SECTION LENGTH (m): 111	SCALE (cm / m): 1/1
					PROJECT #: 165001057
					MAPPER: McEllah
					NAME OF WATERBODY: Trib 3
					CROSSING #:
					STATION #: Upstream
DATE: DD-MMM-YY 09-JUN-17					
<p>LEGEND</p> <p>Ph - phragmites. 10d depth (cm) 6w width → Riffle ⇨ Run/Glide ○ Pool ■ Island/Bar ■ Fine Substrate ### Gravel Substrate o o o o 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 L Culvert</p>					
PROFILE:	Horz. Scale	Vert. Scale			

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					
		o o o o 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			
						<p>steep slope 401 embankment with perched culvert at base - stream on high gradient until run morphology.</p>	

Watercourse Field Record Form

Tab 4

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: 4th 401 CO		DAY: 7	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + ME		WEATHER CONDITIONS: sunny & warm		TIME STARTED: 11 am		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 10.8		DO = 11.56		CONDUCTIVITY (µS/cm): 344 PM 8.35			
PHOTO NUMBERS AND DESCRIPTIONS: (4/5) 743-759 (4/5)									
LOCATION									
NAME OF WATERBODY: trib 4		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: trib 4			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 736569E 4876090N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Forest					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input checked="" type="checkbox"/> Describe: concrete arch						Size (w x h) m ² 8m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s + d/s			SECTION LOCATION: (include on habitat map)						
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 40 m u/s 50 m d/s				CURRENT VELOCITY (m/s): nod					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert	Other			
Percentage of area	30 60	20 10	40 30		run/cascade	run/cascade			
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 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	0.7 ~1m		~1m				
Substrate	Sa Co sa Gr	Sa Gr Co sa Gr	Bo Co sa Co 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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 b/c 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
4 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 #:	165001057	PROJECT DESCRIPTION:	May 401	DAY:	13	MONTH: June
COLLECTORS:				KE & MB	TIME STARTED:	10:45
WEATHER CONDITIONS:				TIME FINISHED:		
				SURFACE CONDITIONS (if applicable):		
				Calm <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):	40 m	Settings:	30 Hz 120 V	Seconds:	464 s	
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/>	#	DIP NET <input type="checkbox"/>	TRAP NET <input type="checkbox"/>			
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>	OTHER <input type="checkbox"/> 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:				
<input type="checkbox"/> Yes <input type="checkbox"/> No		Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>	Other <input type="checkbox"/>	
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Tn64

Circle number if a sample was kept

Number all pages

trib 4

SECTION IDENTIFIER: upstream		SECTION LOCATION: trib 4		SECTION LENGTH (m): 40		SCALE (cm / m): 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 oooo 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 AAA 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		401	

Trib 4

SECTION IDENTIFIER: downstream		SECTION LOCATION: Trib 4		SECTION LENGTH (m): 30		SCALE (cm / m): 1/2	
						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 o o o o 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: Horiz. Scale Vert. Scale							
embankment with large culvert + medium sized stream. stream at moderate gradient.							
steep slope							
Mixed forest							
canopy becomes more closed. D/S.							
Mixed forest							
open canopy							
open canopy - meadow							

Watercourse Field Record Form

Trib 6

GENERAL INFORMATION									
PROJECT #: 105001057		PROJECT DESCRIPTION: Trib 6		DAY: 7	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + ME		WEATHER CONDITIONS: sunny & warm		TIME STARTED: 1:30		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 11.6°		DO: 10.61		CONDUCTIVITY (µS/cm): 381			
PHOTO NUMBERS AND DESCRIPTIONS: (#3) 760-789 (#3)									
LOCATION									
NAME OF WATERBODY: unnamed Trib 6		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib 6			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 739449 E 4876949 N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Forest.					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 3m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s + d/s				SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m):					CURRENT VELOCITY (m/s): mod.				
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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	1.5						
Mean bankfull width (m)	2-4 2	4	4						
Mean bankfull depth (m)	0.6 0.5	1m	0.6						
Substrate	Ss, S, EC, silty ss	silty ss	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	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	5	2		Instream Overhanging 10		Instream 10 Overhanging 72	72
SHORE COVER (% stream shaded):	100 - 90 % <input type="checkbox"/>	90 - 60 % <input checked="" type="checkbox"/>	60 - 30 % <input type="checkbox"/>	30 - 1 % <input type="checkbox"/>	None <input type="checkbox"/>		
VEGETATION TYPE (%)	Submergent		Floating		Emergent		None
Predominant Species					watercress speedwell?		98
MIGRATORY OBSTRUCTIONS:	None		Seasonal impediment woody jam @ fence		Permanent perched culvert 0.55 m d/s		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning trout		Evidence of Groundwater watercress u/s + d/s		Other		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
<p>d/s - retain root wads + woody debris - limit tree removal</p>							
COMMENTS:							
<p>- u/s - run over rocks, slumping bank u/s east side through watercress - small vegetated island u/s of culvert - constructed drainage from east side up embankment frickle 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 as impediment (1.5 + 40 cm) - s/si substrates through most of reach u/s some boulder</p>							
<p>Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____</p>							

Fish Community Inventory Record Form

trib 6

GENERAL INFORMATION						
PROJECT #: 105001057	PROJECT DESCRIPTION: trib 6		DAY: 14	MONTH: June	YEAR: 2017	
COLLECTORS: KE & MG			TIME STARTED:		TIME FINISHED:	
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
			Calm <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
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: <input type="checkbox"/> Colourless <input type="checkbox"/> Yellow/brown <input type="checkbox"/> Blue/green <input type="checkbox"/> Turbid <input type="checkbox"/> Other <input type="checkbox"/>						
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m): 30 m d/s ROW		Settings: 30 Hz 150 V		Seconds: 211 S		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		# OF BAGS		PRESERVATIVE:		
				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/> Other <input type="checkbox"/>
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						


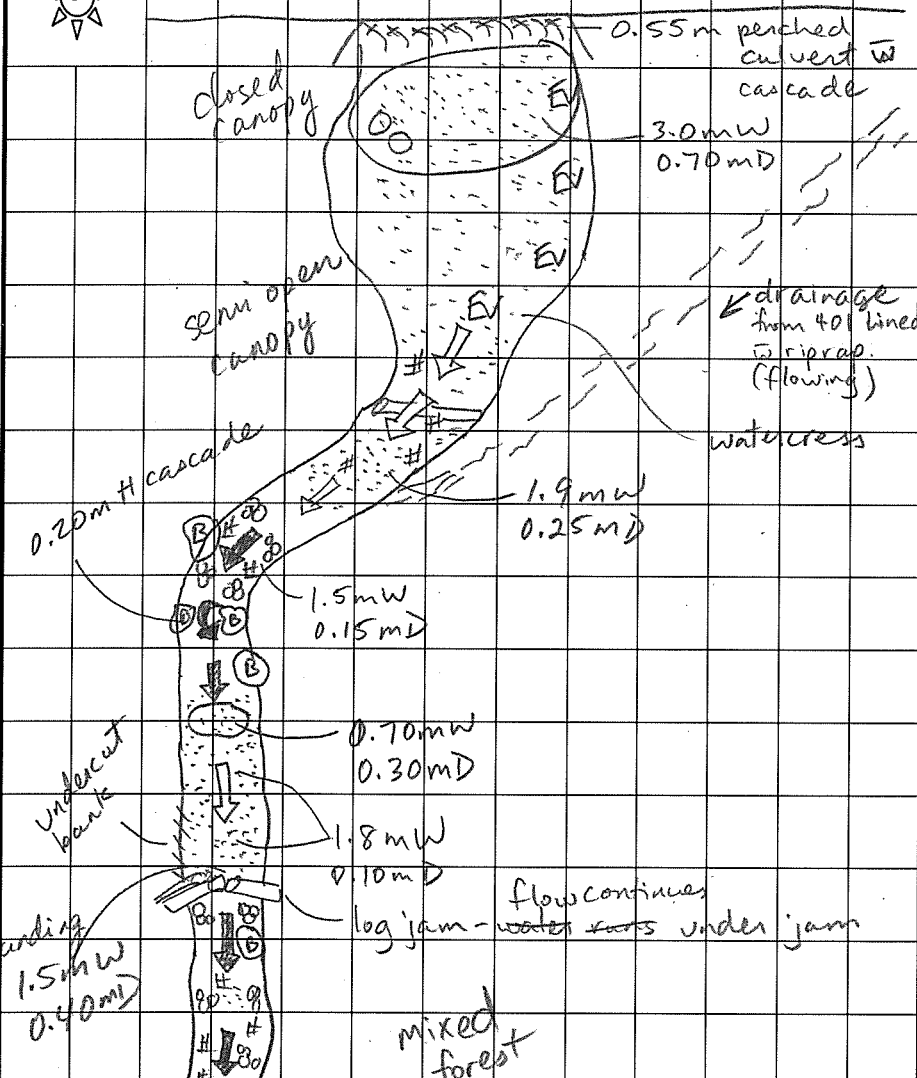
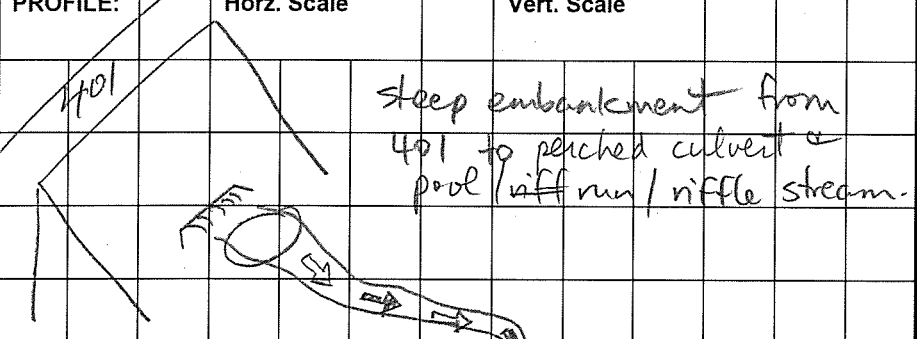
Tals b

Circle number if a sample was kept

Number all pages

SECTION IDENTIFIER:		SECTION LOCATION:		SECTION LENGTH (m):		SCALE (cm / m):	
Trib 6 - upstream		401		20		1/1	
				PROJECT #: 165001057			
				MAPPER: meilah			
				NAME OF WATERBODY: Trib 6			
				CROSSING #:			
				STATION #: upstream			
DATE: DD-MMM-YY 09 JUN-17				LEGEND			
<p>10d depth (cm) 6w width</p> <p>➔ Riffle ➞ Run/Glide ○ Pool ■ Island/Bar ● Fine Substrate ### Gravel Substrate oOooO Cobble /Boulder *** Debris</p> <p>CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress Fe Iron Staining ///// Eroded Bank xxx Riprap / Other Stabilization</p>				<p>○ Instream Log/Tree AAA Dam/Weir/Obstruction ® Riparian Tree ▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line └ Culvert</p>			
				PROFILE:			
				Horz. Scale			
				Vert. Scale			
				bank 0.5-1.0m			
				very steep embankment			
				steep slope			
				moderate slope			
				bank 0.2-0.3m			

Trib 6

SECTION IDENTIFIER: downstream		SECTION LOCATION: Trib 6		SECTION LENGTH (m): 30		SCALE (cm / m): 1/1	
				PROJECT #: 165001057		MAPPER: Ellah	
				NAME OF WATERBODY: Trib 6		CROSSING #:	
				STATION #: downstream		DATE: DD-MMM-YY 07-JUN-17	
				<p>LEGEND</p> <p>10d depth (cm) 6w width</p> <p>➔ 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 AAA Dam/Weir/Obstruction Ⓡ Riparian Tree ▶ Seep/Spring ----- Undercut Bank — Barrier to Fish Movement -S- Seasonal Barrier -x-x- Fence line □ Culvert</p>			
				<p>PROFILE: Horiz. Scale Vert. Scale</p>  <p>steep embankment from 401 to perched culvert & pool/riff run/riffle stream.</p>			

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: Run 401 cobble		DAY: 8	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & ME		WEATHER CONDITIONS: sunny + warm		TIME STARTED: 8:30		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 13.4° DO=10.63		CONDUCTIVITY (µS/cm): 405 PH 7.52					
PHOTO NUMBERS AND DESCRIPTIONS: (45) 865-879 (45)									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 7		DRAINAGE SYSTEM: L.ON.		CROSSING #:		STATION #: Trib 7			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 261790 E 4877676N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: cedar forest				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input checked="" type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 1.8m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s & d/s				SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: CT u/s			
TOTAL SECTION LENGTH (m): 30 d/s				CURRENT VELOCITY (m/s): nod.					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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		~0.4				
Substrate	Co Gr		Gr Co Bz Bo Br		Bz Co Br				
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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/g/Bo ab-1.6 m wide & 0.1 - 0.3 m deep. under cedar trees.

- CT wetland to west season

- banks higher on east side likely floods into wetland on west side during high flows

- d/s- 1.2m riffle over co/Bo/g. ~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 7


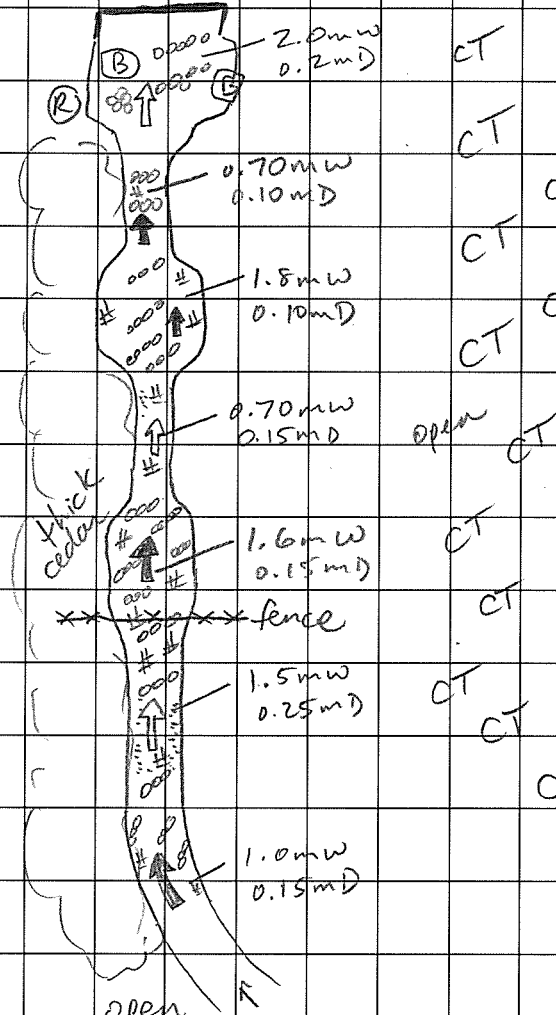
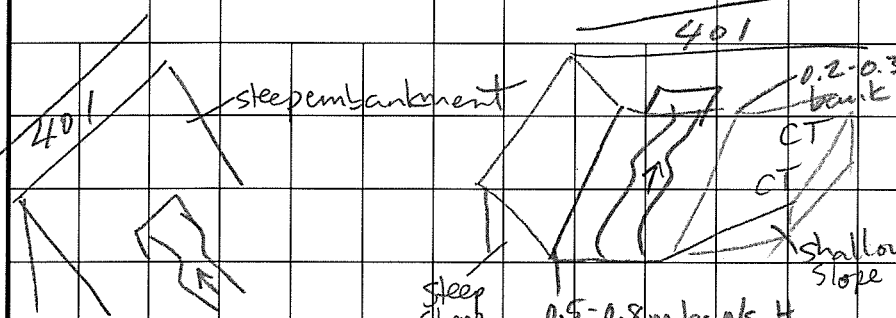
GENERAL INFORMATION						
PROJECT #:	105001057	PROJECT DESCRIPTION:	Rwy 401	DAY:	14	MONTH: June
COLLECTORS:			KE + MO		TIME STARTED:	TIME FINISHED:
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
			Calm <input checked="" type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):	6m 1/5 ROW	Settings:	30 Hz 150V	Seconds:	114 s	
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #	DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>			
SEINE: <input type="checkbox"/>	GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:				
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>	Other <input type="checkbox"/>	
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

trib 7

Circle number if a sample was kept

Oct-06

Trib 7

SECTION IDENTIFIER: Trib 7 upstream		SECTION LOCATION: upstream		SECTION LENGTH (m):		SCALE (cm / m): 1 / 1	
				PROJECT #: 165001057			
				MAPPER: Mellah			
				NAME OF WATERBODY: Trib 7			
				CROSSING #:			
				STATION #: upstream			
DATE: DD-MMM-YY 09-JUN-17							
		<p align="center">LEGEND</p> <p>10d depth (cm) 6w width</p> <p>➔ Riffle ➞ Run/Glide ○ Pool ■ Island/Bar</p> <p>••••• Fine Substrate #### Gravel Substrate oOooO Cobble /Boulder *** Debris</p> <p>CT Cattail SV/FV Submerg/Float Veg EV Emergent Vegetation W Watercress</p> <p>Fe Iron Staining ///// Eroded Bank</p> <p>XXX Riprap / Other Stabilization</p> <p>○ Instream Log/Tree AAA Dam/Weir/Obstruction</p> <p>® Riparian Tree</p> <p>▶ Seep/Spring ----- Undercut Bank</p> <p>— Barrier to Fish Movement -S- Seasonal Barrier</p> <p>-x-x- Fence line □ Culvert</p>					
PROFILE:		Horz. Scale		Vert. Scale			
							

Trib 7

SECTION IDENTIFIER: Trib 7 (downstream)		SECTION LOCATION: 401		SECTION LENGTH (m): 20.0	SCALE (cm / m): 1 / 1
					PROJECT #: 165001057
					MAPPER: MEllah
					NAME OF WATERBODY: Trib 7
					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 AAA 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 #: 165001057		PROJECT DESCRIPTION: Lung 401 Coburg		DAY: 7	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & ME		WEATHER CONDITIONS:		TIME STARTED: 2:40		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 13.3° DO=10.86		CONDUCTIVITY (µS/cm): 360.9 pH 8.22					
PHOTO NUMBERS AND DESCRIPTIONS: 790-843									
LOCATION									
NAME OF WATERBODY: shelter valley creek		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: shelter valley			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 260560 E 4877535 N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Forest				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input checked="" type="checkbox"/> Describe: concrete Arch						Size (w x h) m ² 15m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s = d/s				SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 60 u/s 100m d/s				CURRENT VELOCITY (m/s): Fast					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other			
Percentage of area	60 30		40 10						
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 30 5-10 Sa Co 60		Bo 60 10 Gr 30						
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60 - 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 7-8m x 20-30cm

- run 6-7m x 50-60cm

- d/s - large riffle & run over co/gr/Bo & sa

- 6-8m wide

- 20-60cm 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:	
165001057	Hwy 401		01	06	2017	
COLLECTORS:			TIME STARTED:		TIME FINISHED:	
mellah, K Easterling			15:00		16:00	
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
clear, ~21°C			Calm	Rippled	Wavy	Rough
			0	0	0	0
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 µA
Downstream						
Culvert / Hwy ROW						
WATER COLOUR:						
Colourless <input checked="" type="checkbox"/>		Yellow/brown <input type="checkbox"/>		Blue/green <input type="checkbox"/>		Turbid <input type="checkbox"/> Other <input type="checkbox"/>
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings:		Seconds:		
30		200V, 30 Hz		604		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/> Frozen <input type="checkbox"/> Alcohol <input type="checkbox"/> Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

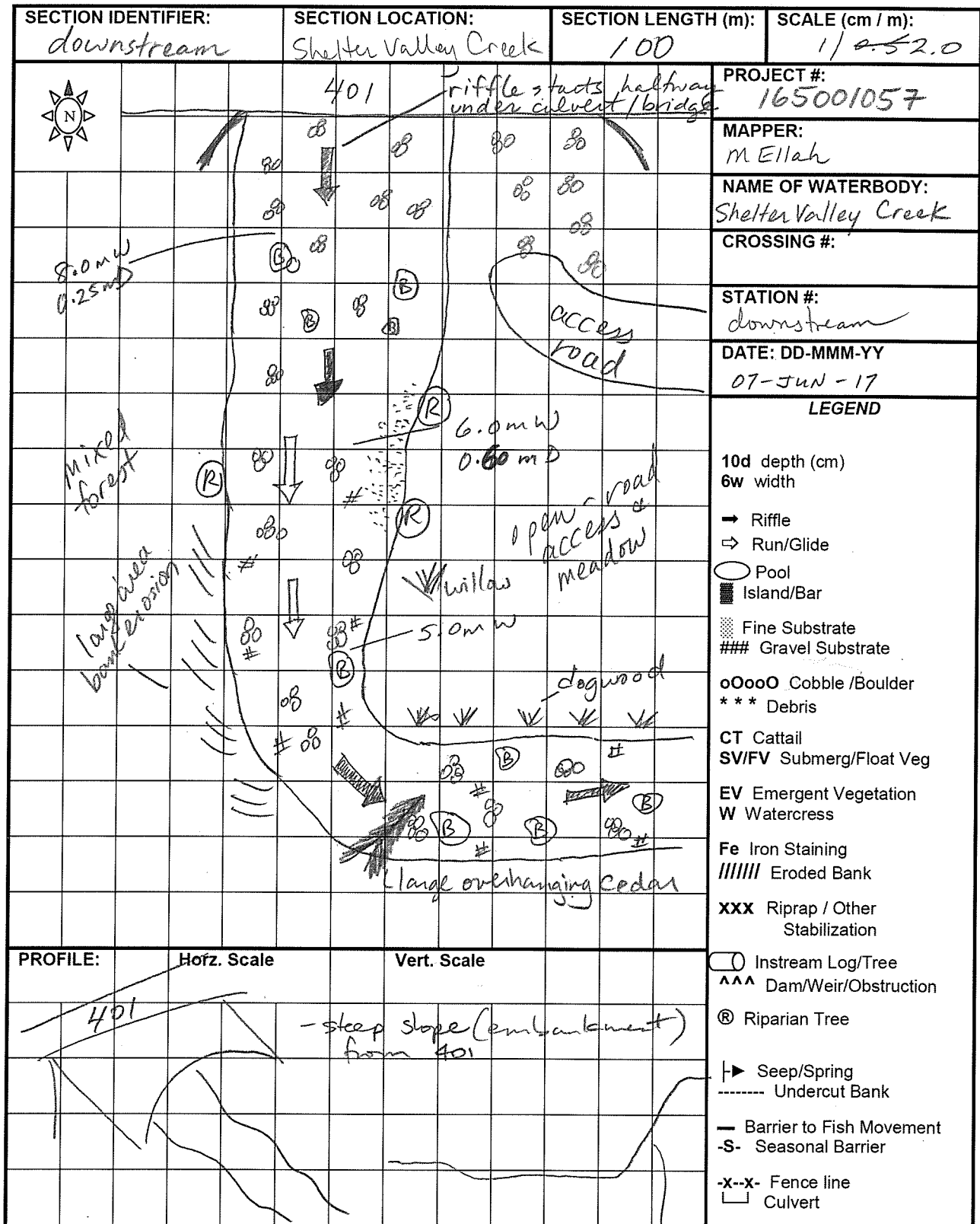
Circle number if a sample was kept

Number all pages

shelter valley

SECTION IDENTIFIER: upstream		SECTION LOCATION: Shelter Valley Creek		SECTION LENGTH (m): 60		SCALE (cm / m): 1 = 0.5-2.0	
						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	
PROFILE:		Horz. Scale		Vert. Scale			

Shelter Valley



GENERAL INFORMATION									
PROJECT #: 16000105		PROJECT DESCRIPTION: Hwy 401		DAY: 7	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + ME		WEATHER CONDITIONS: sunny & warm		TIME STARTED: 4:45 pm		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 18° DO = 7.87		CONDUCTIVITY (µS/cm): 410		pH 8.01			
PHOTO NUMBERS AND DESCRIPTIONS: 844-864									
LOCATION									
NAME OF WATERBODY: unnamed Trib 8		DRAINAGE SYSTEM: L.ON.		CROSSING #: —		STATION #: Trib 8			
LOCATION OF CROSSING: Vernonville Road & 401									
UTM ZONE, EASTING & NORTHING: 17T 262074 E 4877712 N				MTO CHAINAGE: —					
TOWNSHIP: —				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: rural				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input checked="" type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 50 m u/s 100 d/s				CURRENT VELOCITY (m/s): nod.					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other			
Percentage of area	45	20		80	50				
Mean depth wetted (m)	0.09-0.15	0.25-0.45		1-2 cm	1-2 cm				
Mean width wetted (m)	0.4-1.1	1-1.8		1.8-2	1.8-2				
Mean bankfull width (m)	1.5	1.5-2		2.2	2.2				
Mean bankfull depth (m)	0.6	0.6-0.8		0.6	0.6				
Substrate	Gr Si	Co Gr Si		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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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 vernonville 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, ran in rammed channel 0.4 - 1.1 m x 0.9 - 0.15m deep

- flat through dense grassy veg, 1-2cm deep + 1.8 m wide

Additional Notes Appended?



No



Yes

number of pages

Fish Community Inventory Record Form

Trib 8

GENERAL INFORMATION							
PROJECT #: 105001057		PROJECT DESCRIPTION: Hwy 401		DAY: 08	MONTH: JUN	YEAR: 2017	
COLLECTORS: Mellah, K Easterling				TIME STARTED: 11:38		TIME FINISHED:	
WEATHER CONDITIONS: clear, 22°C no precip last 24 hours				SURFACE CONDITIONS (if applicable):			
				Calm <input checked="" type="radio"/>	Rippled 0	Wavy 0	Rough 0
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 <input type="radio"/>	Yellow/brown <input checked="" type="radio"/>	Blue/green <input type="radio"/>	Turbid <input type="radio"/>	Other <input type="radio"/>		
GEAR							
ELECTROFISHER: <input type="radio"/>							
Length (m):		Settings:			Seconds:		
NETS and TRAPS:							
MINNOW TRAP: <input checked="" type="radio"/> # 2		DIP NET <input type="radio"/>		TRAP NET <input type="radio"/>			
SEINE: <input type="radio"/>		GILL <input type="radio"/>		OTHER <input type="radio"/> specify			
HAULS (#):		Period Of Time (24 hour clock):					
		Set 08-JUN-2017 Time 11:38			Clear June 9 2017 time 8:30 am		
LENGTH (m):		MESH SIZE:			DEPTH OF CAPTURE:		
		Smallest (cm):			Minimum (m):		
		Largest (cm):			Maximum (m):		
SAMPLE COLLECTION							
FISH KEPT?		# OF BAGS		PRESERVATIVE:			
<input type="radio"/> Yes <input checked="" type="radio"/> No				Formalin <input type="radio"/>	Frozen <input type="radio"/>	Alcohol <input type="radio"/>	Other <input type="radio"/>
COMMENTS:							
Additional Notes Appended? <input checked="" type="radio"/> No <input type="radio"/> Yes number of pages _____							

Trib 8

No Catch

PAGE _____ **of** _____


Oct-06

trib 8

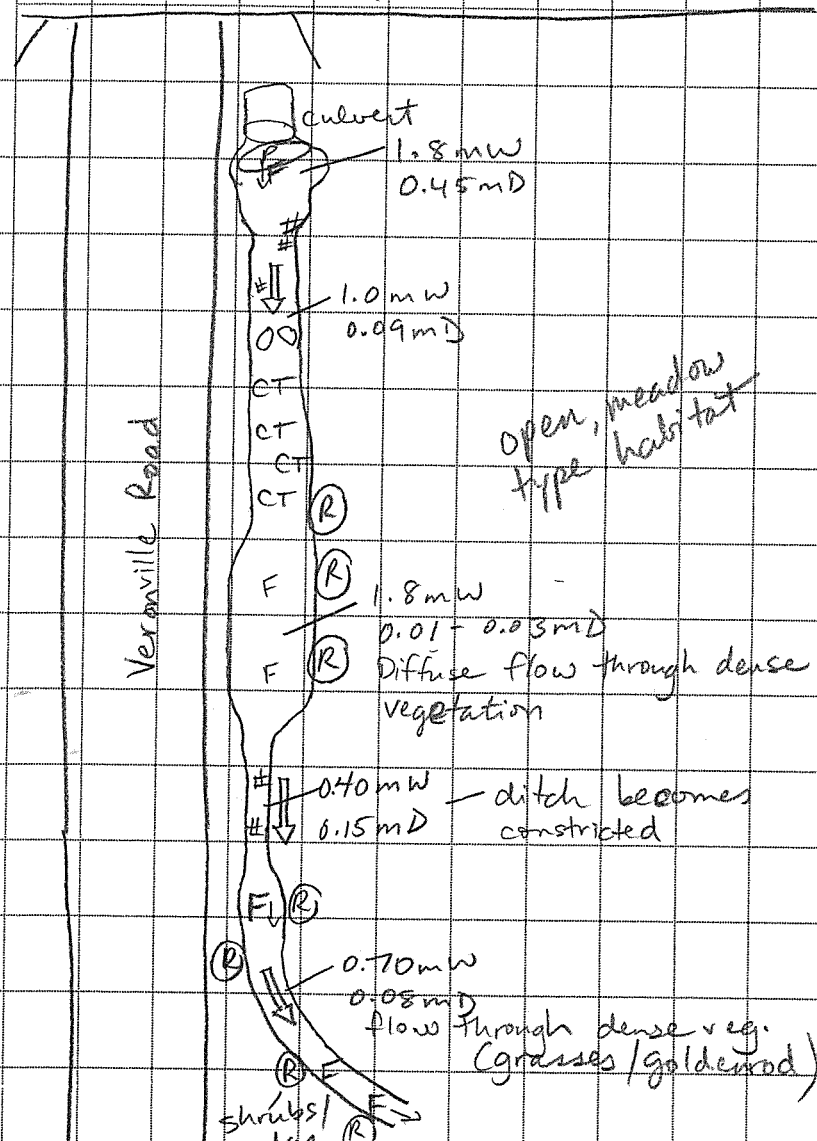
SECTION IDENTIFIER: upstream		SECTION LOCATION: Trib 8		SECTION LENGTH (m): 50		SCALE (cm / m): 1/1	
						PROJECT #: 165001057	
						MAPPER: Mellah	
						NAME OF WATERBODY: Trib 8	
						CROSSING #:	
						STATION #: upstream	
DATE: DD-MMM-YY 07-JUN-17						LEGEND F _→ - flat 10d depth (cm) 6w width ⇒ 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 AAA 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: downstream	SECTION LOCATION: Trib 8	SECTION LENGTH (m): 100	SCALE (cm / m): 1 / 1
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401



PROJECT #:
 16500/057

MAPPER:
 MElah

NAME OF WATERBODY:
 Trib 8

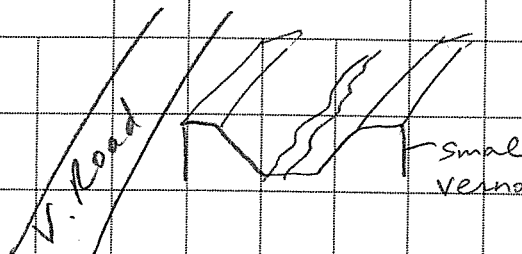
CROSSING #:

STATION #:
 downstream

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
-----------------	--------------------	--------------------



small banks, steep along Vernonville Road

GENERAL INFORMATION									
PROJECT #: 16500657		PROJECT DESCRIPTION: Hwy 401 Corridor		DAY: 8	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & ME		WEATHER CONDITIONS: sunny & warm		TIME STARTED: 9:00		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 12.3° DO = 13.03		CONDUCTIVITY (µS/cm): 1329		pH 8.11			
PHOTO NUMBERS AND DESCRIPTIONS: (#) 880-890 (#)									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 9		DRAINAGE SYSTEM: L.O.N.		CROSSING #:		STATION #: trib 9			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 263320 E 4877873 N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: AS					SOURCES OF POLLUTION: run-off, livestock waste				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: N/S & d/S			SECTION LOCATION: (include on habitat map)						
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 50 d/s				CURRENT VELOCITY (m/s): mod					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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)	3.5 100-100	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	50 Sa 50 Bo	Sa Gr	Co 50 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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
	1	10	10	10		1	48

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input checked="" type="checkbox"/> 4/5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> 4/5	<input type="checkbox"/>

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 reach 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 w/ 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
COLLECTORS:				KE & ME	TIME STARTED:	TIME FINISHED:
WEATHER CONDITIONS:				SURFACE CONDITIONS (if applicable):		
				Calm <input checked="" type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>
						Rough <input type="checkbox"/>
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	5m					
Culvert / Hwy ROW						
WATER COLOUR:						
Colourless <input type="checkbox"/> Yellow/brown <input type="checkbox"/> Blue/green <input type="checkbox"/> Turbid <input type="checkbox"/> Other <input type="checkbox"/>						
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings:		Seconds:		
5m d/s		30Hz 150V		183		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input type="checkbox"/> No				Formalin <input type="checkbox"/> Frozen <input type="checkbox"/> Alcohol <input type="checkbox"/> Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Tab 9

Circle number if a sample was kept

Oct-06

Trib 9

SECTION IDENTIFIER: upstream		SECTION LOCATION: Trib 9		SECTION LENGTH (m): 50		SCALE (cm / m): 1 / 2	
				PROJECT #: 165001057			
				MAPPER: mellah			
				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		banks 0.5-1.0m H moderate embankment moderate slope to stream	

Tnb 9

SECTION IDENTIFIER: Trib 9 (downstream)		SECTION LOCATION: 401		SECTION LENGTH (m): 50	SCALE (cm / m): 1 / 1
				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 AAA 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	

GENERAL INFORMATION									
PROJECT #: 1105001057		PROJECT DESCRIPTION: Hwy 401		DAY: 8	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + ME		WEATHER CONDITIONS: Sunny & warm		TIME STARTED: 9:40		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 11.4° 150 = 13.3		CONDUCTIVITY (µS/cm): 304		pH 8.16			
PHOTO NUMBERS AND DESCRIPTIONS: d/s: 891-898 u/s: 991-1002									
LOCATION									
NAME OF WATERBODY: Trib 10.		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib 10			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 263515 E 4877898 N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Ag				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 40 m u/s				CURRENT VELOCITY (m/s): slow					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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 My		Si My					
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

Watercourse Field Record Form

Thb 10

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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	5 5	90

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species			watercress CT	95

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Brook trout at weir	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 ROW west along fence

- weirs around every island ~ 50m d/s

- a few small watercress @ d/s fence

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

Fish Community Inventory Record Form

Tab 10


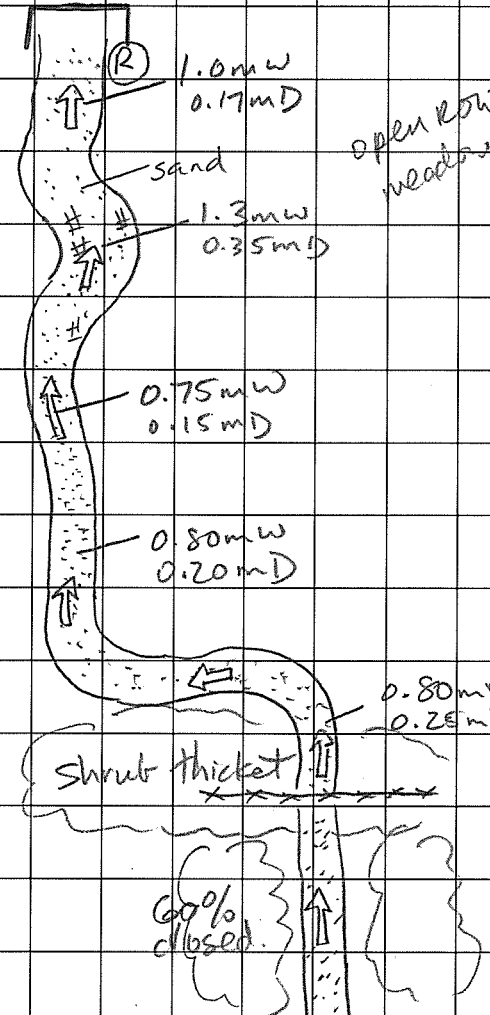
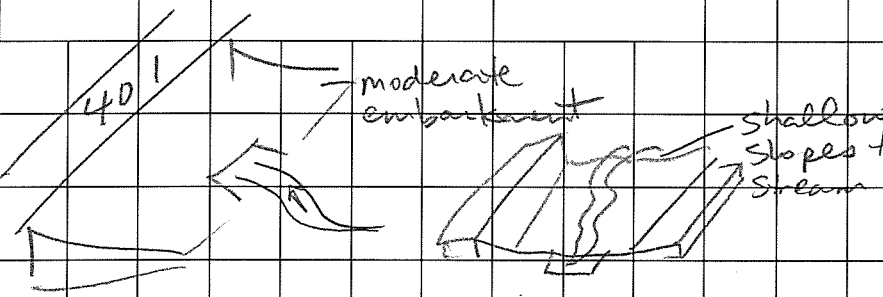
GENERAL INFORMATION						
PROJECT #:	PROJECT DESCRIPTION:		DAY:	MONTH:	YEAR:	
165001057	Hwy 405		8	June	2017	
COLLECTORS:			TIME STARTED:	TIME FINISHED:		
KE & ME			5:30			
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
			Calm	Rippled	Wavy	Rough
			0	0	0	0
GENERAL LOCATION						
NAME OF 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 <input checked="" type="radio"/>	Yellow/brown <input type="radio"/>	Blue/green <input type="radio"/>	Turbid <input type="radio"/>	Other <input type="radio"/>
GEAR						
ELECTROFISHER: <input type="radio"/>						
Length (m):		Settings:		Seconds:		
NETS and TRAPS:						
MINNOW TRAP: <input checked="" type="radio"/> # 2		DIP NET <input type="radio"/>		TRAP NET <input type="radio"/>		
SEINE: <input type="radio"/>		GILL <input type="radio"/>		OTHER <input type="radio"/> specify		
HAULS (#):		Period Of Time (24 hour clock):				
		Set June 8 2017		Clear June 9 2017		
		Time 5:30 pm		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:			
<input type="radio"/> Yes <input checked="" type="radio"/> No			Formalin <input type="radio"/>	Frozen <input type="radio"/>	Alcohol <input type="radio"/>	Other <input type="radio"/>
COMMENTS:						
Additional Notes Appended? <input type="radio"/> No <input type="radio"/> Yes number of pages _____						

Tab 10

Trap 2

PAGE _____ **of** _____ **Number all pages**

Twb 10

SECTION IDENTIFIER: upstream		SECTION LOCATION: Trib 10		SECTION LENGTH (m): 40		SCALE (cm / m): 1 / 1	
		401		PROJECT #: 165001057		MAPPER: mellah	
		ROW		NAME OF WATERBODY: Trib 10		CROSSING #:	
				STATION #: upstream		DATE: DD-MMM-YY 08-JUN-17	
		LEGEND					
PROFILE:		Horz. Scale		Vert. Scale			
							

Set MT
5:30

- 10d depth (cm)
- 6w width
- ➔ Riffle
- ⇨ Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ### Gravel Substrate
- o o o o 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
- AAA 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: downstream		SECTION LOCATION: Trib 10		SECTION LENGTH (m):		SCALE (cm / m): 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 oOoO 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 #: 165001057		PROJECT DESCRIPTION: Hwy 401 Colong		DAY: 8	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & ME		WEATHER CONDITIONS: Sunny & warm		TIME STARTED: 10:10		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 11.6°		DO: 14.17		CONDUCTIVITY (µS/cm): 552 pH 8.04			
PHOTO NUMBERS AND DESCRIPTIONS: d/s; 899-908 u/s; 973-990									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 11		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib 11			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 263892 E 4877946 N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Natural				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input checked="" type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 1.5m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s & d/s		SECTION LOCATION: (include on habitat map)							
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: cattails			
TOTAL SECTION LENGTH (m): 40m				CURRENT VELOCITY (m/s): slow					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other			
Percentage of area						trickle flow 100			
Mean depth wetted (m)						1-3cm 100 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						mud silt			
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	X	X	X	Instream Overhanging	X	Instream Overhanging	95 5

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input checked="" type="checkbox"/> 11/5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> 9/5	<input type="checkbox"/>

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

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		low flow/dry	

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
		originals from ground/s	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- 4/5 - trickle flow through m/s + dense cedars, no defined channel or bed, seeps out of ground

- seep east of culvert 15m contributes flow 10-30cm wide + 1-3cm deep.

- 9/5 - trickle flow through dense CT wetland 30cm wide, 6cm deep

- turns + flows along fence to east + then south into woods.

- channelized in woods ~ 50cm wide + 50cm deep

Additional Notes Appended? ☐ No ☐ Yes number of pages

★ too little water to fish!

SECTION IDENTIFIER: Trib II-upstream		SECTION LOCATION:		SECTION LENGTH (m): 25		SCALE (cm / m): 1/1	
						PROJECT #: 165001057 MAPPER: meilah NAME OF WATERBODY: Trib II 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 11

SECTION IDENTIFIER: downstream		SECTION LOCATION: Trib 11		SECTION LENGTH (m): 30		SCALE (cm / m): 1/1	
						PROJECT #: 165001057	
						MAPPER: M Ellah	
						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 AAA 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			

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: Hwy 401		DAY: 8	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + MTS		WEATHER CONDITIONS:		TIME STARTED: 10:55		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 13.5°		DO=12.84		CONDUCTIVITY (µS/cm): 327 pH=8.22			
PHOTO NUMBERS AND DESCRIPTIONS: d/s: 909-920 u/s: 957-972									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 12		DRAINAGE SYSTEM: L. ON.		CROSSING #: —		STATION #: Trib 12			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 264988 E 4878088 N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: mixed forest.				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 18m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s + d/s.		SECTION LOCATION: (include on habitat map)							
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	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 <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other <input type="checkbox"/>			
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
15	1	5	5	Instream 10 Overhanging	X	Instream X Overhanging X	48

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species			grass	99

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	Trout	Fe stains @ culvert seep up embankment	FE stain u/s culvert ditch drainage down up rap lined embankment near creek it has eroded embankment & Fe stains visible - steep w/ plunge pool, not likely fish habitat d/s seep pool @ culvert, run a riffle over coarse substrates seep ~ 5 m east of creek w/ old rusty culvert

POTENTIAL ENHANCEMENT OPPORTUNITIES:

dense cedar forest u/s 100 core

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 up rap lined embankment near creek it has eroded embankment & Fe stains visible - steep w/ plunge pool, not likely fish habitat
 - d/s- scour pool @ culvert, run a riffle over coarse substrates
 - seep ~ 5 m east of creek w/ old rusty culvert

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

Fish Community Inventory Record Form

Trib 12

GENERAL INFORMATION						
PROJECT #:	PROJECT DESCRIPTION:		DAY:	MONTH:	YEAR:	
105001057	Hwy 4101		14	June	2017	
COLLECTORS:			TIME STARTED:		TIME FINISHED:	
KE + JM						
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
			Calm	Rippled	Wavy	Rough
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 <input type="checkbox"/> Yellow/brown <input type="checkbox"/> Blue/green <input type="checkbox"/> Turbid <input type="checkbox"/> Other <input type="checkbox"/>						
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings:		Seconds:		
5m		30Hz 150V		163S.		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/> Other <input type="checkbox"/>
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

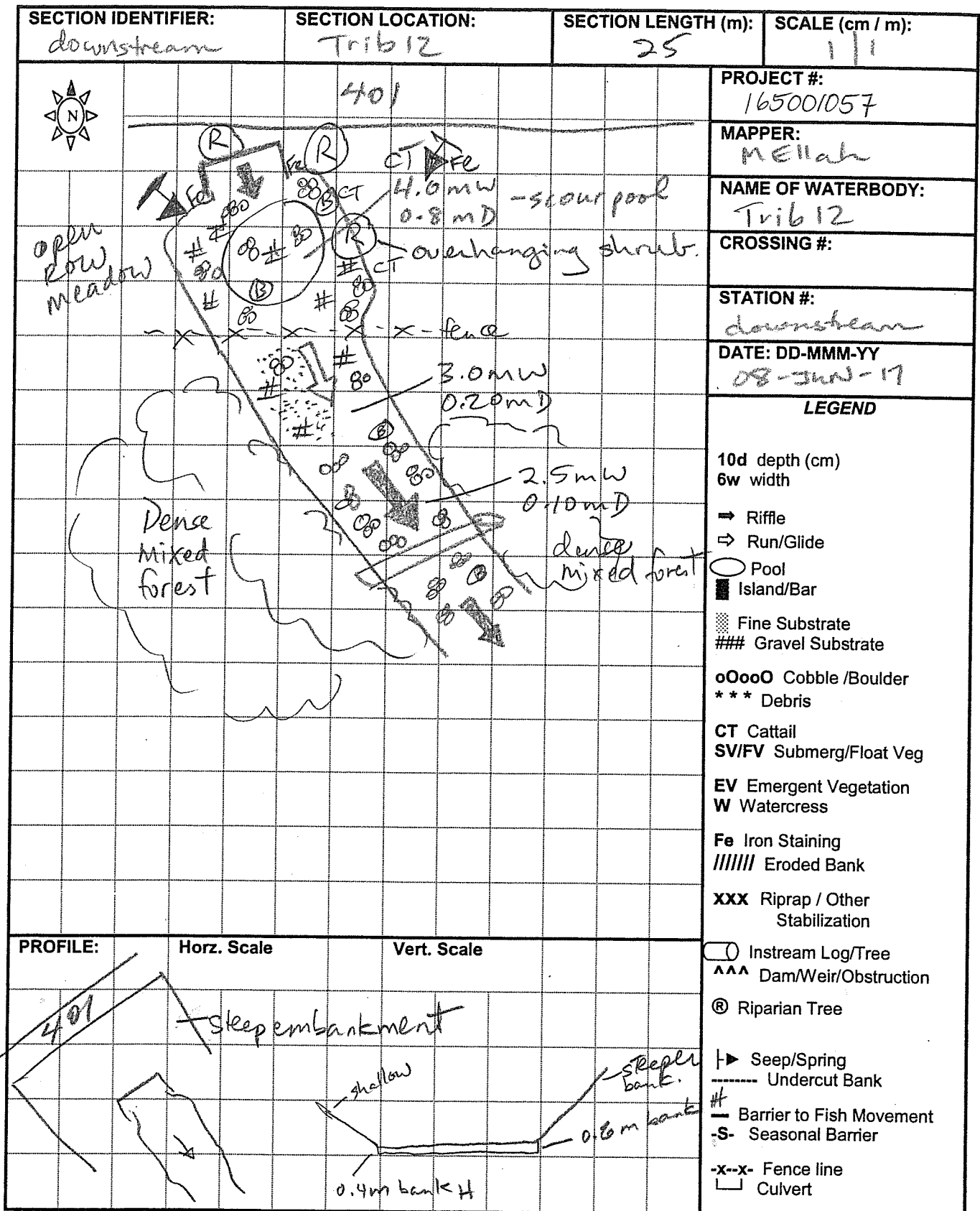
trib 12

Circle number if a sample was kept

Oct-06

SECTION IDENTIFIER: Trib 12 - upstream		SECTION LOCATION: Trib 12		SECTION LENGTH (m): 25		SCALE (cm / m): 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 AAA Dam/Weir/Obstruction							
® Riparian Tree							
▶ Seep/Spring ----- Undercut Bank							
— Barrier to Fish Movement -S- Seasonal Barrier							
-x-x- Fence line □ Culvert							

Trib 12



GENERAL INFORMATION									
PROJECT #: 105001057		PROJECT DESCRIPTION: Hwy 401		DAY: 8	MONTH: June	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE ME & BO		WEATHER CONDITIONS: sunny & hot		TIME STARTED: 1:30		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 16.9°		DO = 11.34		CONDUCTIVITY (µS/cm): 1016 pH 7.97			
PHOTO NUMBERS AND DESCRIPTIONS: d/s: 921-932, interchange: 933-948, u/s: 949-956									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 13		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib 13			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 267367E 4878575N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: township highway cemetery					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input checked="" type="checkbox"/> R2		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: CT d/s of interchange			
TOTAL SECTION LENGTH (m): 10m u/s 150 m				CURRENT VELOCITY (m/s): mod.					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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	~1m	0.8	~0.7	0.4				
Substrate	gr co BO	gr co	co gr BO gr co	BO gr 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 13

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 Overhanging 20	20

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VEGETATION TYPE (%)	Submergent	Floating	Emergent	None
Predominant Species			ct	99

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 - w/abe are w/gr in concrete lined channel @ culvert
 - large catch basin/drain
 - u/s of fence dense veg & ct channel - w 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 x 6.1m deep
 - w/gr/sa run d/s
 d/s interchange - run into flat over g/sa 80cm 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:	
105001057	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
			0	0	0	0
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	
	0	0	0	0	0	
GEAR						
ELECTROFISHER: 0						
Length (m):	Settings:		Seconds:			
50 m	60 Hz 150 V		343 s			
NETS and TRAPS: 2 netter						
MINNOW TRAP: 0 #	DIP NET 0		TRAP NET 0			
SEINE: 0	GILL 0		OTHER 0 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:				
0 Yes 0 No		Formalin 0	Frozen 0	Alcohol 0	Other 0	
COMMENTS:						
Additional Notes Appended? 0 No 0 Yes number of pages _____						

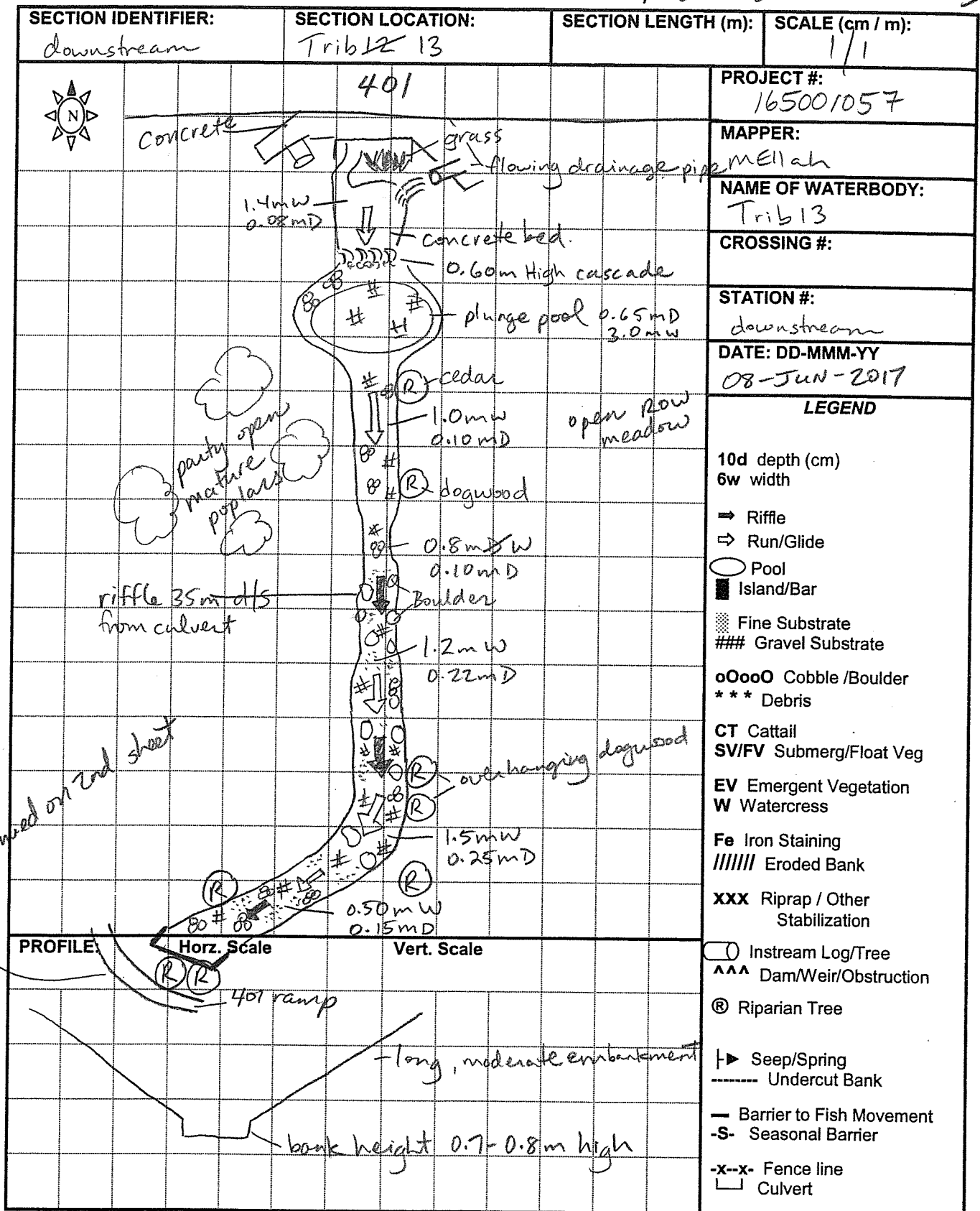
Tn6 13

Circle number if a sample was kept

Number all pages

Trib 13

SECTION IDENTIFIER: upstream		SECTION LOCATION: Trib 13		SECTION LENGTH (m):		SCALE (cm / m): 1-1	
						PROJECT #: 165001057	
						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			



SECTION IDENTIFIER: downstream of 401 ramp		SECTION LOCATION: Trib 13		SECTION LENGTH (m):		SCALE (cm / m): 1/1	
<p>401</p> <p>see other assessment sheet for this reach</p> <p>401 ramp</p> <p>CT CT CT</p> <p>-x-x-x-x-x-x-x-x-</p> <p>CT CT CT</p> <p>CT CT CT</p> <p>CT CT CT</p> <p>CT</p> <p>FORESTED</p> <p>0.70mW</p> <p>0.05mD</p> <p>0.0mW</p> <p>0.05mD</p> <p>flow/channel widens & slows</p>				PROJECT #: 165001057			
				MAPPER: mellah			
				NAME OF WATERBODY: Trib 13			
				CROSSING #:			
				STATION #: downstream of 401 ramp			
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 AAA 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			
<p>401 ramp</p> <p>steep embankment</p> <p>stream</p> <p>shallow banks</p> <p>0.10m bank</p>							

*APPENDIX D2:
SUMMER (SEPTEMBER 2017)*

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: May 901		DAY: 20	MONTH: Sept.	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + ISC		WEATHER CONDITIONS: hot & sunny		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: too little to		CONDUCTIVITY (µS/cm): YSI					
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1954-1963 d/s: 1904-1909									
LOCATION									
NAME OF WATERBODY: unnamed Trib OA		DRAINAGE SYSTEM: Lake Ontario		CROSSING #:		STATION #: Trib OA			
LOCATION OF CROSSING: east of Nagle Rd.									
UTM ZONE, EASTING & NORTHING: 17T 728196 E 4875011 N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: commercial				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): slow					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other Thicket			
Percentage of area						100			
Mean depth wetted (m)						1 cm			
Mean width wetted (m)						10 cm			
Mean bankfull width (m)						3 m			
Mean bankfull depth (m)						20.5			
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

Trb OA

BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
	/	5	5	/	/	/	
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None		
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> beyond ROW	<input checked="" type="checkbox"/> ROW	<input type="checkbox"/>		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
Predominant Species	/		/		/		100
MIGRATORY OBSTRUCTIONS:	None		Seasonal		Permanent		
	/		low flow		/		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater		Other		
	/		/		/		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
<p>↑ riparian cover improve connections to u/s wetland; u/s of culvert.</p>							
COMMENTS:							
<p>- u/s - completely dry in ROW, puddle @ ROW fence & moist soil can deep beyond.</p> <p>- d/s - trickle flow through culvert & wrap lined channel & into adjacent bush</p>							
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____							

GENERAL INFORMATION									
PROJECT #: 105001057		PROJECT DESCRIPTION: Hwy 401		DAY: 20	MONTH: Sept	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + JSC		WEATHER CONDITIONS:		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 17.7°		DO = 2.16		CONDUCTIVITY (µS/cm): 586			
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1943-1953 d/s: 1910-1920									
LOCATION									
NAME OF WATERBODY: unnamed Trib. ØB		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib ØB			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 729475 E 4875475 N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: cedar bush					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 4m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s + d/s			SECTION LOCATION: (include on habitat map)						
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 30 u/s + 25 d/s				CURRENT VELOCITY (m/s): slow					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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: mu sa		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

Trib 013

BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
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 % <input type="checkbox"/>	90 - 60% <input type="checkbox"/>	60- 30% <input type="checkbox"/>	30 - 1% <input checked="" type="checkbox"/>	None <input type="checkbox"/>		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
Predominant Species	/		/		watercress speedwell 80		80
MIGRATORY OBSTRUCTIONS:	None /		Seasonal /		Permanent /		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater water/mud dls		Other		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
COMMENTS:							
<p>- u/s - rap/riffle sequence - we beyond Row right side</p> <p>- run - sa/silt ~3m wide + 20cm deep</p> <p>- riffle ulin Row over riverstone ~2m wide</p> <p>- 10-15 cm deep</p> <p>- small drainage adjacent wetland pocket dry</p> <p>- nrap used to culvert on west side</p> <p>- dls - trickle in ditch nrap channel, flows under nrap to culvert @ edge</p> <p>- run/riffle sequence, shallow flow</p> <p>fine cobble</p>							
<p>Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____</p>							

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: Hwy 401		DAY: 26	MONTH: Sept	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & JSC		WEATHER CONDITIONS:		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 17.1 °C DO = 7.26		CONDUCTIVITY (µS/cm): 693 pH 8.10					
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1921 - 1930 d/s: 1935 - 1942									
LOCATION									
NAME OF WATERBODY: unnamed Trib. AC		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib. AC			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 729973 E 4875846N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: wetland & cedars				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: CT			
TOTAL SECTION LENGTH (m): outside Row in Row				CURRENT VELOCITY (m/s):					
SUB-SECTION(S)	Run <input checked="" type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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)	?	20.3				0.3			
Substrate	?	5' Gr				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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
	/	X	1	/	/	100% 4/5	
SHORE COVER (% stream shaded):	100 - 90 % <input type="checkbox"/>	90 - 60% <input type="checkbox"/>	60 - 30% <input checked="" type="checkbox"/>	30 - 1% <input type="checkbox"/>	None <input type="checkbox"/>		
VEGETATION TYPE (%):	Submergent		Floating		Emergent		None
Predominant Species	/		/		watercress + CT		
MIGRATORY OBSTRUCTIONS:	None /		Seasonal 100% flow		Permanent /		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater watercress!		Other		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
<p>* school of 404 cyprinids observed in d/l pool</p>							
COMMENTS:							
<p>- u/s - CT wetland @ & beyond Row - dense watercress @ culvert, no observable channel, just trickle flow through veg</p> <p>- d/l - pool @ 1.5 = 0.1 m deep w/ 5/6 m - dense watercress 3 m beyond culvert to Row fence - beyond Row fence channel observed ~1.5 m wide</p>							


Additional Notes Appended?

☐ No

☐ Yes

number of pages

flows toward Row just east of culvert & west, outside of Row fence

SECTION IDENTIFIER:		SECTION LOCATION:		SECTION LENGTH (m):		SCALE (cm / m):	
d/s + d/s		Trib ØC					
 <div style="position: relative; height: 150px;"> <div style="position: absolute; top: 10%; left: 10%;">no access</div> <div style="position: absolute; top: 20%; left: 15%;">~ 1.5 m wide</div> <div style="position: absolute; top: 30%; left: 15%;">substrates visible</div> <div style="position: absolute; top: 40%; left: 40%;">FF</div> <div style="position: absolute; top: 50%; left: 35%;">1.5 m wide riprap/gr</div> <div style="position: absolute; top: 60%; left: 25%;">Hwy 401</div> <div style="position: absolute; top: 65%; left: 35%;">weir</div> <div style="position: absolute; top: 70%; left: 35%;">2 m</div> <div style="position: absolute; top: 75%; left: 35%;">1 m</div> <div style="position: absolute; top: 80%; left: 45%;">construction sock</div> <div style="position: absolute; top: 85%; left: 45%;">watercress</div> <div style="position: absolute; top: 90%; left: 45%;">10-8 m long</div> <div style="position: absolute; top: 95%; left: 45%;">moist ditch</div> <div style="position: absolute; top: 95%; left: 10%;">dry</div> <div style="position: absolute; top: 95%; left: 35%;">CT</div> </div>				PROJECT #:			
				MAPPER:			
				NAME OF WATERBODY:			
				CROSSING #:			
				STATION #:			
DATE: DD-MMM-YY				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			
Sept 20 2017							
w/s & d/s							
Hwy 401							
weir							
2 m							
1 m							
construction sock							
watercress							
10-8 m long							
moist ditch							
dry							
CT							
Hwy 401							
weir							
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1 m							
construction sock							
watercress							
10-8 m long							
moist ditch							
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watercress							
10-8 m long							
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10-8 m long							
moist ditch							
dry							
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Hwy 401							
weir							
2 m							
1 m							
construction sock							
watercress							
10-8 m long							
moist ditch							
dry							
CT							
Hwy 401							
weir							
2 m							
1 m							
construction sock							
watercress							
10-8 m long							
moist ditch							
dry							
CT							

Watercourse Field Record Form

Trib 1

GENERAL INFORMATION

PROJECT #: 105001057	PROJECT DESCRIPTION: Coharr	DAY: 18	MONTH: 8/16	YEAR: 2017
Is STREAM REALIGNMENT required for this section: <input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Unknown				
COLLECTORS: KE + JSC	WEATHER CONDITIONS:	TIME STARTED: 8:50	TIME FINISHED:	
AIR TEMP:	WATER TEMP: 12.6° DO = 9.58	CONDUCTIVITY (µS/cm): 520 PH = 8.32		
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1894-1903 d/s: 1527-1535				

LOCATION

NAME OF WATERBODY: unnamed Trib. 1	DRAINAGE SYSTEM: L.O.N.	CROSSING #: —	STATION #: Trib 1
---------------------------------------	----------------------------	------------------	----------------------

LOCATION OF CROSSING:

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

LAND USE AND POLLUTION

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

EXISTING STRUCTURE TYPE

Bridge <input type="radio"/>	Box Culvert <input checked="" type="radio"/>	Open Foot Culvert <input type="radio"/>	CSP <input type="radio"/>	N/A <input type="radio"/>
Other <input type="radio"/> Describe:				Size (w x h) m ² 2.5 m

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:
	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	

TOTAL SECTION LENGTH (m): 20 m	CURRENT VELOCITY (m/s): mod.
-----------------------------------	---------------------------------

SUB-SECTION(S)	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Inside culvert <input type="radio"/>	Other riffle cascade		
Percentage of area	30	10	60			100		
Mean depth wetted (m)	0.1	0.4	0.07			0.05-0.15		
Mean width wetted (m)	2	2	2			1-2 m		
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 Co	Sa Gr	Co 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

Trb1

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	Permanent
	/	cascade ROW -40cm fence	/

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 boulders / cobbles / fr.
Fe stain left bank @ culvert
- dense cedar bush
- slight undercut banks

Additional Notes Appended? ☐ No ☐ 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 <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
GENERAL LOCATION						
NAME OF WATERBODY:			LOCATION OF STATION:			
unnamed Trib 1						
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m): 15		Settings: 25 Hz 150 V		Seconds:		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>
				Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

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Circle number if a sample was kept

Number all pages

Watercourse Field Record Form

Trib 2

GENERAL INFORMATION									
PROJECT #: 1105001057		PROJECT DESCRIPTION: Hwy 401 Cobourg		DAY: 18	MONTH: 8pt	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KEA JSC		WEATHER CONDITIONS:		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 12.7 DO=9.08		CONDUCTIVITY (µS/cm): 493		pH: 8.19			
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1888-1893 d/s: 1536-1550									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 2		DRAINAGE SYSTEM: L. ON.		CROSSING #: ←		STATION #: Trib 2			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 733246 E 4876374 N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: mixed forest				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input checked="" type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 3.8m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s + d/s		SECTION LOCATION: (include on habitat map)							
TYPE:	Stream / river <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: CT			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): slow					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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)	0.7	>1m							
Substrate	coarse	coarse							
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

Watercourse Field Record Form

Tnbo 2

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
	10	/	5	/	/	5	80

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> d/s	<input checked="" type="checkbox"/> u/s	<input type="checkbox"/>

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

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater Fe & watercress	Other

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

-u/s- wetland blw highway & side road w/ 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 transition to narrow run over coarse substrates
 Fe left bank, watercress right

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

Fish Community Inventory Record Form

Trib 2

GENERAL INFORMATION						
PROJECT #:	PROJECT DESCRIPTION:		DAY:	MONTH:	YEAR:	
105001057	Hwy 401 Cobourg		18	Sept.	2017	
COLLECTORS:			TIME STARTED:		TIME FINISHED:	
KE & JSC						
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
			Calm <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings:		Seconds:		
		2547 200V				
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>	Other <input type="checkbox"/>
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Th b 2

Circle number if a sample was kept

Number all pages

Watercourse Field Record Form

Trib 3

GENERAL INFORMATION								
PROJECT #: 105001057		PROJECT DESCRIPTION: Hwy 401		DAY: 18	MONTH: Sept.	YEAR: 2017		
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown								
COLLECTORS: KE & SSC		WEATHER CONDITIONS:		TIME STARTED:		TIME FINISHED:		
AIR TEMP:		WATER TEMP: 13° DO = 8.12		CONDUCTIVITY (µS/cm): 769		pH: 8.08		
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1868-1887 d/s: 1551-1563								
LOCATION								
NAME OF WATERBODY: unnamed Trib.3		DRAINAGE SYSTEM: L. ON.		CROSSING #: —		STATION #: Trib 3		
LOCATION OF CROSSING:								
UTM ZONE, EASTING & NORTHING: 17T 735157 E 4875780 N				MTO CHAINAGE:				
TOWNSHIP:				MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION								
SURROUNDING LAND USE: mixed forest.				SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE								
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 1.8m		
SECTION TYPE AND MORPHOLOGY								
SECTION IDENTIFIER: u/s & d/s		SECTION LOCATION: (include on habitat map)						
TYPE:	Stream / river <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:		
TOTAL SECTION LENGTH (m): 20m				CURRENT VELOCITY (m/s): slow				
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input checked="" type="checkbox"/>	Other		
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 Ci	Muck Mu	Detritus D

Watercourse Field Record Form

Tnb 3

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
10	/	/	5	10 10	/	/	65

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60 %	60 - 30 %	30 - 1 %	None
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> u/s	<input type="checkbox"/>

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

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		5cm - 15cm low flow over cascades	perched culvert 1.6m

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	potential	watercress u/s culvert	-

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - moist to dry channel from east, channelized by flow, 0.5 - 1m wide & sa / Bo substrates

- main source of flow from west, through rap

- rap mound near culvert barrier in low flow

- 0.5 wide 1-2 cm deep eroded silt

- drains from phrag / CT to west

- d/s perched culvert pool/cascade sequence

substrates co gr cl sil!

u/s wetland appears to be a large deep, lots watercress +

trickling water in phrag / CT to culvert

- large pool @ end of culvert to west ~ 35cm deep in dense phrag

Additional Notes Appended?

☐ No☐ Yes

number of pages

Fish Community Inventory Record Form

Trib 3

GENERAL INFORMATION						
PROJECT #:	105001057		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 <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings: 25Hz 200V		Seconds: 153s		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>
				Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Trlb 3

Circle number if a sample was kept

Number all pages

Watercourse Field Record Form

Trib 4

GENERAL INFORMATION									
PROJECT #: 1105001057		PROJECT DESCRIPTION: Hwy 401 Cobourg		DAY: 18	MONTH: Sept	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & JSC		WEATHER CONDITIONS: hot & sunny		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 13.8 DO = 7.99		CONDUCTIVITY (µS/cm): 496		pH 8.29			
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1858-1867 d/s: 1564-1597									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 4		DRAINAGE SYSTEM: L. ON.		CROSSING #: —		STATION #: Trib 4			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 736569 E 4876090 N				MTO CHAINAGE: —					
TOWNSHIP: Forest				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE:				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input checked="" type="checkbox"/> Describe: Arch concrete culvert						Size (w x h) m ² 8m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s & d/s		SECTION LOCATION: (include on habitat map)							
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: <input checked="" type="checkbox"/>			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): nod					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other			
Percentage of area	50	50	10						
Mean depth wetted (m)	0.3-0.4	0.5	0.1						
Mean width wetted (m)	4	6m	4						
Mean bankfull width (m)	4.5	4.5	4.5						
Mean bankfull depth (m)	50.8m	70.5	0.6						
Substrate	B/Gr 50% S/G 50%	Gr 100%	B/G 60% Gr 40%						
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

Watercourse Field Record Form

Trb 4

BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
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		
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
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 dis				
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
COMMENTS:							
<p>- w/s wide slow run into culvert Bol/Gr/Si/</p> <p>- riffle over Bol/ up of Row</p> <p>- watercress on left bank</p> <p>- unlikely up passage through culvert for non-jumpers</p> <p>- dis cascade/riffle/run over gr/co/ra substrates</p> <p>primarily run habitat -</p> <p>soft substrates on right bank where lamprey caught</p>							
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____							

Fish Community Inventory Record Form

Trib 4

GENERAL INFORMATION									
PROJECT #:	165001057	PROJECT DESCRIPTION:	Hwy 401	DAY:	18	MONTH:	Sept	YEAR:	2017
COLLECTORS:				TIME STARTED:		TIME FINISHED:			
WEATHER CONDITIONS:				SURFACE CONDITIONS (if applicable):					
hot & sunny				Calm	Rippled	Wavy	Rough		
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>				
GEAR									
ELECTROFISHER: <input checked="" type="checkbox"/>									
Length (m):		Settings:			Seconds:				
		25Hz 200V			201				
NETS and TRAPS:									
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>					
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:					
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>	Other <input type="checkbox"/>		
COMMENTS:									
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____									

Tn b 4

Circle number if a sample was kept

Number all pages

Watercourse Field Record Form

Trib 6

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: Hwy 401 Cobourg		DAY: 17	MONTH: xpt	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + JSC		WEATHER CONDITIONS:		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 12.3° DO=9.67		CONDUCTIVITY (µS/cm): 530		pH 8.15			
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1845-1857 d/s: 1598-1608									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 6		DRAINAGE SYSTEM: L. ON.		CROSSING #: /		STATION #: Trib 6			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 739449 E 4876949 N				MTO CHAINAGE: /					
TOWNSHIP: /				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE:					SOURCES OF POLLUTION:				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): slow					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other cascade			
Percentage of area	100	20				20			
Mean depth wetted (m)	0.1	0.1				0.03			
Mean width wetted (m)	0.5	1.5				1.5			
Mean bankfull width (m)	2.5	2				1.5			
Mean bankfull depth (m)	0.5	0.5				0.2			
Substrate	simu	sil				co cr			
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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 ^{approx}

- steep embankments w/ areas of collapse 0.1 m deep

- d/s - plunge pool, pool/cascade/run sequence
silt layer over cl/sa/gr.

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

Trib 6

GENERAL INFORMATION						
PROJECT #:	PROJECT DESCRIPTION:		DAY:	MONTH:	YEAR:	
1105001057	Hwy 401		18	Sept	2017	
COLLECTORS:			TIME STARTED:		TIME FINISHED:	
KE + JSC						
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
			Calm <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings:		Seconds:		
		25Hz 200V		162		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input type="checkbox"/> No				Formalin <input type="checkbox"/> Frozen <input type="checkbox"/> Alcohol <input type="checkbox"/> Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Tab 6

Circle number if a sample was kept

Number all pages

Watercourse Field Record Form

Trib 7

GENERAL INFORMATION									
PROJECT #: 1165001057		PROJECT DESCRIPTION: Hwy 401		DAY: 18	MONTH: Sept	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE + JSC		WEATHER CONDITIONS: hot & sunny		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 17.5°		DO: 7.01		CONDUCTIVITY (µS/cm): 499 @ 8.11			
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1834-1844 d/s: 1609-1616									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 7		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib. 7			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 261790 E 4877676 N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE:				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 1.8m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s + d/s		SECTION LOCATION: (include on habitat map)							
TYPE:	Stream / river <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): red.					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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	Cobbles		CO						
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

Watercourse Field Record Form

Tnb 7

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
	/	/	10	10	/	/	80

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60 - 30%	30 - 1%	None
	<input type="checkbox"/>	<input checked="" type="checkbox"/> d/s	<input checked="" type="checkbox"/> d/s	<input type="checkbox"/>	<input type="checkbox"/>

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	/	/	watercress u/s + d/s	

MIGRATORY OBSTRUCTIONS:	None	Seasonal	Permanent
		low flow in 60	

POTENTIAL CRITICAL HABITAT LIMITING:	Spawning	Evidence of Groundwater	Other
	yes trout	watercress d/s	

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- shallow run over c/g/sa under cedars, WC @ edge of cedars u/s from culvert
0.6 - 1.2 m wide

- d/s - cobble riffle b/w culvert & row & beyond shallow & slow.

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

Trib 7

GENERAL INFORMATION									
PROJECT #:	165001057	PROJECT DESCRIPTION:	Hwy 401	DAY:	8	MONTH:	Sept	YEAR:	2017
COLLECTORS:				TIME STARTED:		TIME FINISHED:			
WEATHER CONDITIONS:				SURFACE CONDITIONS (if applicable):					
hot & sunny				Calm	Rippled	Wavy	Rough		
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>				
GEAR									
ELECTROFISHER: <input checked="" type="checkbox"/>									
Length (m):		Settings:			Seconds:				
		25 Hz 200 V			101				
NETS and TRAPS:									
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>					
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:					
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>	Other <input type="checkbox"/>		
COMMENTS:									
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____									

Fish Community Inventory Record Form

[illegible]

Circle number if a sample was kept

PAGE _____ **of** _____

Number all pages

Watercourse Field Record Form

shelter valley

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: Hwy 401		DAY: 19	MONTH: Sept.	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE JSC JM		WEATHER CONDITIONS: sunny, 24°C		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP:		CONDUCTIVITY (µS/cm):					
PHOTO NUMBERS AND DESCRIPTIONS: 1714 - 1770									
LOCATION									
NAME OF WATERBODY: Shelter Valley Creek		DRAINAGE SYSTEM: L. ON.		CROSSING #: —		STATION #: Shelter Valley			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 260560 E 4877535N				MTO CHAINAGE: —					
TOWNSHIP: —				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Forest				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input checked="" type="checkbox"/> Describe: Arched concrete						Size (w x h) m ² 15 m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: 46 + d/s		SECTION LOCATION: (include on habitat map)							
TYPE:	Stream / river <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 40 u/s 100 d/s				CURRENT VELOCITY (m/s): fast					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other			
Percentage of area	70 45	5	30 50						
Mean depth wetted (m)	0.3-0.4 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 Sg Gr	Cl	Bo Co Co Gr						
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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	Fl stain	/

POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

- u/s - riffle/run over co/bol/gr

- d/s - large riffle over co/bol/gr, transitions to run over co/sa/gr

- scar pool @ d/s bend in river

- many chinook observed u/s & d/s.

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

Fish Community Inventory Record Form

Shelter
Valley

GENERAL INFORMATION						
PROJECT #:	165001057	PROJECT DESCRIPTION:	Hwy 401	DAY:	19	MONTH: YEAR: 2017
COLLECTORS: Katie Easterling, Jackie Metcalfe, Jess Sosa Campos				TIME STARTED:		TIME FINISHED:
WEATHER CONDITIONS: sunny, 24°C			SURFACE CONDITIONS (if applicable):			
			Calm <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings: 30 Hz, 200 V		Seconds: 614		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/> Frozen <input type="checkbox"/> Alcohol <input type="checkbox"/> Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

shelter valley

Circle number if a sample was kept

Number all pages

Watercourse Field Record Form

Trib 8

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: Hwy 401		DAY: 19	MONTH: Sept	YEAR: 2017			
Is STREAM REALIGNMENT required for this section:									
<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> 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 <input type="radio"/>		Box Culvert <input type="radio"/>		Open Foot Culvert <input type="radio"/>		CSP <input checked="" type="radio"/>		N/A <input type="radio"/>	
Other <input type="radio"/> Describe:						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: 115 + d115		SECTION LOCATION: (include on habitat map)							
TYPE:	Stream / river <input type="radio"/>	Channelized <input type="radio"/>	Permanent <input type="radio"/>	Intermittent <input checked="" type="radio"/>	Ephemeral <input type="radio"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m):		CURRENT VELOCITY (m/s): dry							
SUB-SECTION(S)	Run <input type="radio"/>	Pool <input type="radio"/>	Riffle <input type="radio"/>	Flats <input type="radio"/>	Inside culvert <input type="radio"/>	Other			
Percentage of area									
Mean depth wetted (m)									
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

Tub 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 Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
	/	/	/	/	/	90 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
Predominant Species	/	/	100 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?

0 No 0 Yes

number of pages _____

Watercourse Field Record Form

Trib 9

GENERAL INFORMATION								
PROJECT #:		PROJECT DESCRIPTION:		DAY:	MONTH:	YEAR:		
1185001057		Trib 9		18	Sept	2017		
Is STREAM REALIGNMENT required for this section:								
<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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 48 77873 N								
TOWNSHIP:				MNR DISTRICT:				
				Peterborough				
LAND USE AND POLLUTION								
SURROUNDING LAND USE:				SOURCES OF POLLUTION:				
Ag				run-off				
EXISTING STRUCTURE TYPE								
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>
Other <input type="checkbox"/> Describe:						Size (w x h) m ²		
SECTION TYPE AND MORPHOLOGY								
SECTION IDENTIFIER:			SECTION LOCATION:					
u/s + d/s			(include on habitat map)					
TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:		
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
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)		71m	70.4	70.3				
Substrate		Coarse	Coarse	Coarse				
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
	/	10	10	Instream 2 Overhanging 3	/	Instream / Overhanging /	

SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60- 30%	30 - 1%	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 Bq/co/la substrates
- undercut bank u/s right side
- small cascade over large rock @ fence
- side channel right, lots of erosion w/ 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 _____

Trib 9

GENERAL INFORMATION							
PROJECT #:	105001057	PROJECT DESCRIPTION:	May 401	DAY:	18	MONTH: YEAR:	Sept. 2017
COLLECTORS:				TIME STARTED:		TIME FINISHED:	
WEATHER CONDITIONS:				SURFACE CONDITIONS (if applicable):			
wet & sunny				Calm	Rippled	Wavy	Rough
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>		
GEAR							
ELECTROFISHER: <input checked="" type="checkbox"/>							
Length (m):		Settings: 3042 150 V			Seconds: 1035		
NETS and TRAPS:							
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>			
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/> Other <input type="checkbox"/>	
COMMENTS:							
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____							

trb 9

Oct-06

Watercourse Field Record Form

Trib 10

GENERAL INFORMATION									
PROJECT #: 168001057		PROJECT DESCRIPTION: Coburn		DAY: 18	MONTH: Sept.	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown									
COLLECTORS: KE JSC		WEATHER CONDITIONS: hot & sunny		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 18.1 DO 6.70		CONDUCTIVITY (µS/cm): 440		pH 8.28			
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1807-1816 d/s: 1629-1639									
LOCATION									
NAME OF WATERBODY: unnamed Trib.10		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib 10			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 263515E 4877898N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE: Ag				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ²			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: d/s + d/s.		SECTION LOCATION: (include on habitat map)							
TYPE:	Stream / river <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m): 30m				CURRENT VELOCITY (m/s):					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other standing			
Percentage of area		20		80					
Mean depth wetted (m)		0.05		0.2		20			
Mean width wetted (m)		0.5-0.7		0.6		0.1-0.2			
Mean bankfull width (m)		1-1.5		0.6		1.5			
Mean bankfull depth (m)		3-4		0.6		2			
Substrate		0.4		0.4		0.5			
		simu		simu		simu			
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Ci	Muck Mu	Detritus D	

Watercourse Field Record Form

Trk 10

BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
	/	/	/	/	/	/ 60	40
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60 - 30%	30 - 1%	None		
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
VEGETATION TYPE (%)	Submergent		Floating		Emergent		None
Predominant Species	/				10 watercress d/s CT bullrush		90
MIGRATORY OBSTRUCTIONS:	None		Seasonal		Permanent		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater watercress d/s near fence		Other		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
<p>-u/s- retain ash tree</p> <p>→ watercress u/s ~ 3m from culvert</p> <p>meanders</p>							
COMMENTS:							
<p>-u/s- narrow flat through grassy Row to pool @ culvert, silt/mud substrates</p> <p>-d/s- altered, rectangle pool @ culvert, narrow channel flows south under fence & west outside Row.</p> <p>-soft, muck substrate</p>							
<p>Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____</p>							

Trb10

GENERAL INFORMATION						
PROJECT #:	PROJECT DESCRIPTION:		DAY:	MONTH:	YEAR:	
165001057	Hwy 401		18	Sept	2017	
COLLECTORS:			TIME STARTED:		TIME FINISHED:	
KE + JSC						
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
het + sunny			Calm	Rippled	Wavy	Rough
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings:		Seconds:		
		30 Hz 150 V		106		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/> Frozen <input type="checkbox"/> Alcohol <input type="checkbox"/> Other <input type="checkbox"/>		
COMMENTS:						
NO Catch						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Circle number if a sample was kept

Number all pages

Watercourse Field Record Form

Trib 11

GENERAL INFORMATION									
PROJECT #: 1105001057		PROJECT DESCRIPTION: Hwy 401		DAY: 19	MONTH: Sept.	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & JSC		WEATHER CONDITIONS: hot & sunny		TIME STARTED: 8:40		TIME FINISHED:			
AIR TEMP:		WATER TEMP: dry		CONDUCTIVITY (µS/cm):					
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1797-1806 d/s: 1670-1676									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 11		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib 11			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 263892 E 4877946N				MTO CHAINAGE:					
TOWNSHIP:				MNR DISTRICT: Peterborough					
LAND USE AND POLLUTION									
SURROUNDING LAND USE:				SOURCES OF POLLUTION: run-off					
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> Describe:						Size (w x h) m ² 1.5m			
SECTION TYPE AND MORPHOLOGY									
SECTION IDENTIFIER: u/s & d/s				SECTION LOCATION: (include on habitat map)					
TYPE:	Stream / river <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: CT			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): dry					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other			
Percentage of area									
Mean depth wetted (m)									
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

Trib 11

BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
HABITAT							
IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris Instream Overhanging	Organic debris	Vascular Macrophytes Instream Overhanging	None
	/	/	/	/	/	100 0	0
SHORE COVER (% stream shaded):	100 - 90 %	90 - 60%	60 - 30%	30 - 1%	None		
	<input checked="" type="checkbox"/> a/s	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> d/s	<input type="checkbox"/>		
VEGETATION TYPE (%)	Submergent		Floating		Emergent		None
Predominant Species	/		/		100 CT		
MIGRATORY OBSTRUCTIONS:	None		Seasonal		Permanent		
	/		dry		/		
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning		Evidence of Groundwater		Other		
	/		/		/		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
<p>1. 1.5m BIF, s/m</p> <p>2. dense cedar bush</p> <p>3. standing water in culvert - 1-2cm</p> <p>4. side drainage dry from east side NFH - 50cm drop to culvert</p>							
COMMENTS:							
<p>- a/s - dry flow path ~ 1.5m BIF, s/m</p> <p>- dense cedar bush</p> <p>- standing water in culvert - 1-2cm</p> <p>- side drainage dry from east side NFH - 50cm drop to culvert</p> <p>- d/s - CT marsh (dry) @ culvert & in ROW</p> <p>- channel beyond ROW dry with CT</p>							
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____							

Watercourse Field Record Form

Trib 12

GENERAL INFORMATION									
PROJECT #: 1105001057		PROJECT DESCRIPTION: trib 401		DAY: 19	MONTH: Sept	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & JSC		WEATHER CONDITIONS: hot & sunny		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 15.7 DO: 7.87		CONDUCTIVITY (µS/cm): 561 pH 8.49					
PHOTO NUMBERS AND DESCRIPTIONS: u/s: 1785-1796 d/s: 1677-1688									
LOCATION									
NAME OF WATERBODY: unnamed Trib. 12		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib 12			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 264988 E 4878088 N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: mixed forest					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND:			
TOTAL SECTION LENGTH (m):				CURRENT VELOCITY (m/s): slow					
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	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	2.5						
Mean bankfull depth (m)	0.5 0.5	>1m	0.5+						
Substrate	Sa Gr Co Sa Lo Br	Sa D	Gr Fr 1.5						
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	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Right Upstream Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
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		
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
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 dls		/		
POTENTIAL ENHANCEMENT OPPORTUNITIES:							
COMMENTS:							
<p>-u/s- run/nibble sequence 1-2m over co/gr/sa</p> <p>-d/s- pool @ culvert, lots of fish observed in pool</p> <p>* side drainage u/s eroded channel east & west</p>							
Additional Notes Appended? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes number of pages _____							

side: East side drains down slope & into wetland, which may drain into u/s reach beyond ROW - dry.
west side down embankment to creek - dry

GENERAL INFORMATION						
PROJECT #:	165001057	PROJECT DESCRIPTION:	HWY 401	DAY:	19	MONTH: 09
COLLECTORS:				Katie Easterling & Jess Sosa Campos	TIME STARTED:	9:15
				TIME FINISHED:	9:30	
WEATHER CONDITIONS:			cloudy, & hot			
			SURFACE CONDITIONS (if applicable):			
			Calm <input type="checkbox"/>	Rippled <input type="checkbox"/>	Wavy <input type="checkbox"/>	Rough <input type="checkbox"/>
GENERAL LOCATION						
NAME OF WATERBODY:			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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		5m		Settings:	30Hz, 150V	
				Seconds:	70	
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>
				Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Trib 12

Oct-06

GENERAL INFORMATION									
PROJECT #: 165001057		PROJECT DESCRIPTION: Hwy 401		DAY: 19	MONTH: Sept.	YEAR: 2017			
Is STREAM REALIGNMENT required for this section: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown									
COLLECTORS: KE & JSC		WEATHER CONDITIONS: hot & sunny		TIME STARTED:		TIME FINISHED:			
AIR TEMP:		WATER TEMP: 14.9		DO = 7.43		CONDUCTIVITY (µS/cm): 1074 pH = 8.05			
PHOTO NUMBERS AND DESCRIPTIONS: 1931-1934, u/s: 1711-1713, d/s: 1689-1710 & 1831-1833									
LOCATION									
NAME OF WATERBODY: unnamed Trib.13		DRAINAGE SYSTEM: L. ON.		CROSSING #:		STATION #: Trib 13			
LOCATION OF CROSSING:									
UTM ZONE, EASTING & NORTHING: 17T 267367 E 4878575N					MTO CHAINAGE:				
TOWNSHIP:					MNR DISTRICT: Peterborough				
LAND USE AND POLLUTION									
SURROUNDING LAND USE: township cemetery highway.					SOURCES OF POLLUTION: run-off				
EXISTING STRUCTURE TYPE									
Bridge <input type="checkbox"/>		Box Culvert <input checked="" type="checkbox"/>		Open Foot Culvert <input type="checkbox"/>		CSP <input type="checkbox"/>		N/A <input type="checkbox"/>	
Other <input type="checkbox"/> 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 <input type="checkbox"/>	Channelized <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	ASSOCIATED WETLAND: cr d/s of interchange			
TOTAL SECTION LENGTH (m): 10 m u/s 150 d/s			CURRENT VELOCITY (m/s): slow						
SUB-SECTION(S)	Run <input type="checkbox"/>	Pool <input type="checkbox"/>	Riffle <input type="checkbox"/>	Flats <input type="checkbox"/>	Inside culvert <input type="checkbox"/>	Other			
Percentage of area	dry 80	dry 10							
Mean depth wetted (m)	5-10cm	0.7							
Mean width wetted (m)	10-61	3.5							
Mean bankfull width (m)	1-1.5	3.5							
Mean bankfull depth (m)	0.4	21m							
Substrate	coar. s.s.	sa. gr.							
Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D	

Watercourse Field Record Form

Tr 13

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Right Upstream Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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
	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

VEGETATION TYPE (%)	Submergent	Floating	Emergent	None
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 contributing flow
 - minimal water in highway ditch, possible ground water inputs.

- d/s - concrete ledge from Hwy culvert ~ 8m, then 70cm drop into plunge pool
 - narrow channel 0.6-1m wide w/ cobbles/sa substrates ~ 5-10 cm flow to interchange culvert.

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

Trib 13

GENERAL INFORMATION						
PROJECT #:	PROJECT DESCRIPTION:		DAY:	MONTH:	YEAR:	
165001057	Hwy 401		19	Sept	2017	
COLLECTORS:			TIME STARTED:		TIME FINISHED:	
KE + JSC						
WEATHER CONDITIONS:			SURFACE CONDITIONS (if applicable):			
hot + sunny			Calm	Rippled	Wavy	Rough
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 <input type="checkbox"/>	Yellow/brown <input type="checkbox"/>	Blue/green <input type="checkbox"/>	Turbid <input type="checkbox"/>	Other <input type="checkbox"/>	
GEAR						
ELECTROFISHER: <input checked="" type="checkbox"/>						
Length (m):		Settings:		Seconds:		
		30 Hz 250 V		265		
NETS and TRAPS:						
MINNOW TRAP: <input type="checkbox"/> #		DIP NET <input type="checkbox"/>		TRAP NET <input type="checkbox"/>		
SEINE: <input type="checkbox"/>		GILL <input type="checkbox"/>		OTHER <input type="checkbox"/> 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:		
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Formalin <input type="checkbox"/>	Frozen <input type="checkbox"/>	Alcohol <input type="checkbox"/>
				Other <input type="checkbox"/>		
COMMENTS:						
Additional Notes Appended? <input type="checkbox"/> No <input type="checkbox"/> Yes number of pages _____						

Trib L3

Oct-06