

Appendix D – Natural Sciences Existing Conditions and Preliminary Impact Assessment Report, Highway 401 Power Dam Bridge

Natural Sciences Existing Conditions and Preliminary Impact Assessment Report

Preliminary Design and Environmental Assessment

Highway 401 Power Dam Bridge

Ministry of Transportation, Eastern Region

Agreement No. 4019-E-0023, Assignment No. 4

G.W.P. 4092-19-00

Presented to:

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Project No. 201979404

April 3, 2024

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TERRESTRIAL\\REPORTING\\WORKING\\FINAL-MTO-POWER DAM DRIVE-
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1. INTRODUCTION

1.1 Overview and Purpose

Morrison Hershfield Limited (MH), now Stantec Consulting Limited, has been retained by the Ontario Ministry of Transportation (MTO) Eastern Region to prepare the Preliminary Design and complete a Class Environmental Assessment (EA) Study for the conceptual design of a bridge which carries Power Dam Drive over Highway 401 (Site No. 013X-180/BO) including interchange modifications, near the town of Cornwall Ontario. The proposed bridge replacement and interchange modifications are planned for an existing transportation facility (Highway 401), which are intended to accommodate movements in all directions, and to address increased traffic demands, and operational and safety concerns. As such, it is classified as a Group B Project under the *MTO Class Environmental Assessment for Provincial Transportation Facilities* (2000).

As part of the EA process, an evaluation of preliminary design alternatives was completed for the project to determine the preferred design based on a number of feasibility elements. Initially, ten (10) design alternatives were proposed for the Highway 401 and Power Dam Drive interchange; and subsequently six (6) were selected to move forward with further studies before one was selected as the preferred (Alternative 8). The Highway 401 and Power Dam Drive Study Area (herein referred to as the 'Study Area') within this terrestrial existing conditions and impact assessment report includes the preferred design alternative plus a 120 m zone of investigation to facilitate Study Area characterization and potential impact assessment.

This report provides a synopsis of the project limits, survey methodology, and detailed summaries of the existing terrestrial conditions within the Study Area. Environmental information used for the production of this report has been assembled from background sources, direct correspondence with regulatory agencies, as well as from current field data specifically collected for this project. This report also provides a high-level overview of the works that MTO is proposing to undertake within the Study Area and the associated works that could potentially affect the terrestrial environment and Species at Risk (SAR) habitat. The impact assessment includes a description of the proposed works that have the potential to affect wildlife and natural areas and the proposed avoidance and mitigation measures. All components of this report have been completed as per the requirements of the *MTO Environmental Reference for Highway Design* (2013).

1.2 Project Location

The location of the interchange is near the community of Cornwall, approximately 2.9 km west of the intersection between Highway 401 and Highway 138, which falls within the Township of South Stormont, within the United Counties of Stormont, Dundas and Glengarry. The Study Area is located within the Kemptville District of the Ministry of Natural Resources and Forestry (MNRF), as well as the jurisdiction of the Raisin Region Conservation Authority (RRCA).

Currently, an overpass carries traffic north-south along Power Dam Drive, over Highway 401. The partial interchange's current configuration only allows exit from Highway 401 eastbound and entrance to Highway 401 westbound. The proposed (new) bridge replacement will consider any future interchange improvements during the service life of the structure.

Figure 1 provides an overview of the Study Area at the existing intersection between Power Dam Drive and Highway 401.

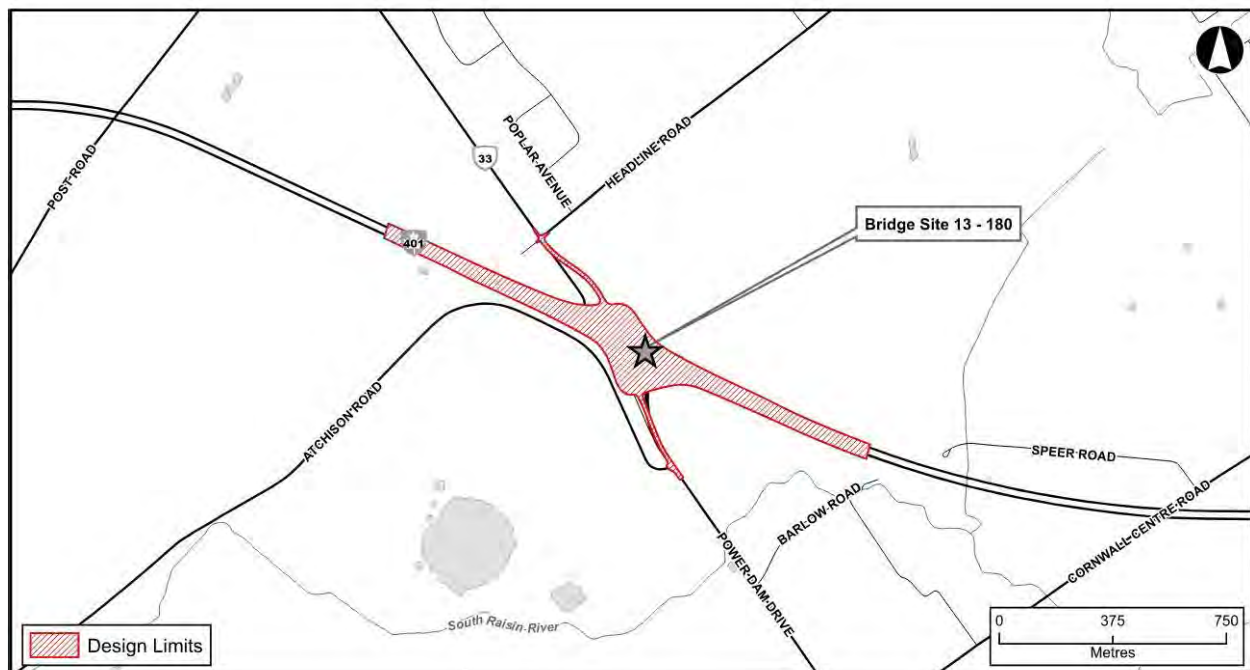


Figure 1: Key map of the Study Area for the Highway 401 and Power Dam Drive Interchange

2. CONSTRAINTS AND OPPORTUNITIES

A review of potential biological constraints related to terrestrial features, including SAR, designated natural areas, and Significant Wildlife Habitat (SWH) was completed for the Highway 401 and Power Dam Drive interchange. The Study Area contains a mix of forested and cultural features (e.g., roads) that may provide suitable and significant habitats for several wildlife species including candidate nesting habitat for migratory birds and candidate bat maternity habitat.

Results of the background research, agency consultation and the 2022 field studies were used to determine the habitat function and significance within the Study Area and illustrated on Error! Reference source not found..

One (1) Eastern Meadowlark (*Sturnella magna*), designated as Threatened under the *Endangered Species Act* (ESA), was observed during the June 23, 2022 breeding bird survey at Breeding Bird Station (BBS) 24 within an open agricultural (OAG) community located south of Highway 401 and east of Power Dam Drive. The OAG community was dominant in long grasses and contained minimal shrub cover, considered preferred breeding habitat for this species.

Three (3) Barn Swallow (*Hirundo rustica*), designated as Special Concern under the ESA, were observed during the 2022 breeding bird surveys; one (1) at BBS 19 on June 15, 2022, and two (2) at BBS 17 on June 23, 2022. These individuals were observed during breeding season within suitable nesting habitat. No nests were identified under the Power Dam Drive overpass.

Patches of Wild Parsnip (*Pastinaca sativa*) were observed throughout the right-of-way (ROW) communities adjacent to Highway 401. Wild Parsnip is a phototoxic plant; caution should be used when conducting work within these areas for worker safety (MNRF, 2021). Additionally, multiple stands of invasive Common Reed (*Phragmites australis* ssp. *australis*) were identified within the Power Dam Drive and Highway 401 ROWs within the Study Area. Invasive Common Reed is an aggressively spreading plant that outcompetes native vegetation species for water and nutrients, often establishing dense monocultures difficult to eradicate (MNRF, 2022b).

As the Study Area has been observed to support nesting habitat for migratory birds, and potential roosting habitat for bat species, timing constraints have been identified for the project as it relates to vegetation clearing and include the implementation of specific timing windows and mitigation measures. For breeding birds and bats, the timing constraint for vegetation removal includes no clearing from April 15 to August 31, and from April 1 to September 30, respectively.

More information regarding candidate SAR habitat, SWH and designated natural areas can be found in **Section** Error! Reference source not found..

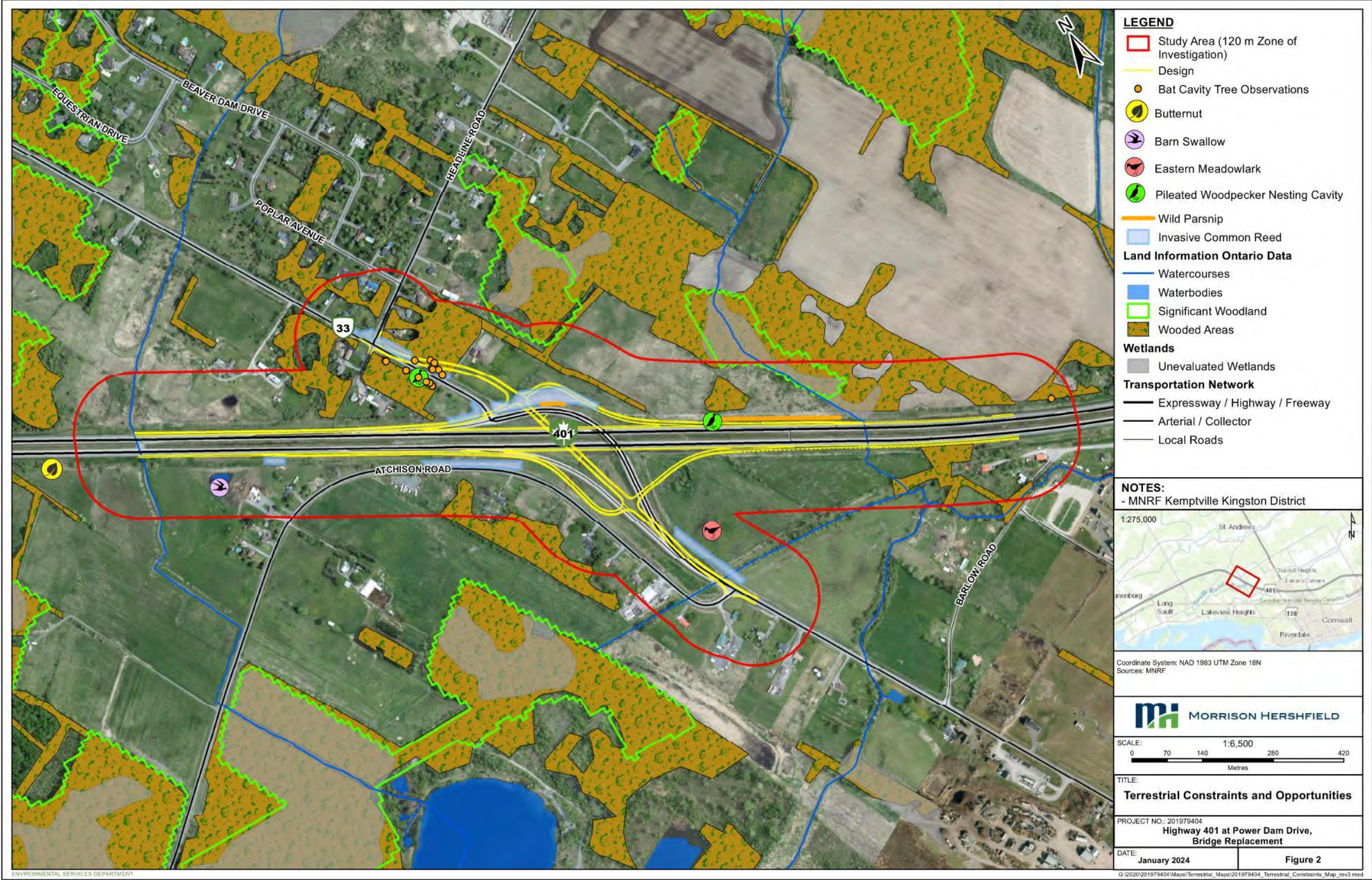


Figure 2: Terrestrial Constraints and Opportunities within the Study Area

3. BACKGROUND DATA COLLECTION

Background data collection is important in determining past environmental conditions of the Study Area as well as informing potential field investigation planning to confirm the conditions. For the purposes of this study, several online sources were accessed as well as correspondence with the MNRF – Kemptville office, Raisin River Conservation Authority (RRCA), and MTO. Background information regarding the Highway 401 and Power Dam Drive Study Area was collected and synthesized from the following sources:

- United Counties of Stormont, Dundas, Glengarry Official Plan
- Provincial Policy Statement
- Significant Wildlife Habitat Technical Guide (MNRF, 2000) and Ecoregional Criteria Schedules for region 6E (2015)
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
- Species at Risk Public Registry (2021)
- Natural History of Canadian Mammals (Naughton, 2012)
- Land Information Ontario
- Ontario Regulation 230/08 “Species at Risk in Ontario List”
 - Species at Risk Ontario range maps
- Natural Heritage Information Centre (NHIC)
- Ontario Breeding Bird Atlas (OBBA)
- Ontario Reptile and Amphibian Atlas (ORAA)
- Ontario Butterfly Atlas (OBA)

3.1 Agency Consultation

An Information Request was sent to the MNRF Kemptville District to obtain information regarding natural heritage features and functions for lands within the Study Area on December 16, 2021, and a follow up email on February 9, 2022. A response was received on June 2, 2022.

Additionally, an information request was sent to the MTO on January 14, 2022, to confirm SAR information gathered from online resources and a follow up email was sent on February 8, 2022. The MTO provided a response on February 28th, 2022, confirming MH’s list of SAR species occurrences within 2 km of the Highway 401 and Power Dam Drive Interchange Study Area. The SAR information provided within the correspondence is considered confidential and has therefore been redacted.

Additionally, an Information Request was sent to the RRCA on April 19, 2022, and followed up on June 15, 2022. A response was received on June 20, 2022.

All communications with MNRF, MTO and RRCA regarding SAR and natural heritage features has been included in **APPENDIX B**.

3.2 Official Plan

The *United Counties of Stormont, Dundas, Glengarry Official Plan* (SDG Counties, 2018b) illustrates that the Study Area is situated adjacent to lands designated as Rural District and Rural Settlement Area according to the SDGExplorer Official Plan In-Effect map (SDG Counties, 2018a). The Rural District (Section 3.4.6) represents a variety of land uses that are appropriate for a rural location and includes a limited amount of residential and commercial development, as well as farms, forests, and natural areas. The Rural Settlement Area (Section 3.4.4) represents a small community within the rural area.

3.3 Provincial Policy Statement

The Provincial Policy Statement provides policy direction on provincial matters of interest related to land use planning and development. The Provincial Policy Statement sets the policy framework for regulating development and use of land and is issued under the authority of Section 3 of the *Planning Act*. The revised Provincial Policy Statement came into effect on May 1, 2020.

Section 2.1 of the Provincial Policy Statement (2020) outlines policies that provide legislative protection for the natural environment. These policies include the exclusion of development within: PSWs, habitat of Endangered and Threatened species, fish habitat, Significant Wildlife Habitat, Significant Woodlands, Significant Valleylands, Areas of Natural and Scientific Interest and adjacent lands “*unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions*”. **Section 4** illustrates all significant land features recorded through background research and observed during the 2022 field investigations.

4. FIELD INVESTIGATIONS

Field investigations were conducted on April 21, 2022, June 15, 2022, and June 23, 2022, to obtain background information collected for the Study Area, and to confirm or augment known terrestrial existing conditions within and adjacent to the Study Area (i.e., the 120 m zone of investigation surrounding the proposed Highway 401/ Power Dam Drive interchange). Incidental wildlife observations during the field investigations were the result of visual confirmation, auditory confirmation, or detection of other evidence of a species presence (e.g., tracks, scat, feeding signs).

Field investigations were conducted in accordance with the MTO's *Environmental Reference of Highway Design* (2013) terrestrial ecosystems requirements, including:

- Vegetation community mapping, including dominant species associations, was carried out using Ecological Land Classification (ELC) to ecosite level.
- Verification of evaluated wetland boundaries where applicable to the Project undertaking
- List of wildlife species observed (or evidence of presence – such as scat, trails, browse) within each vegetation community or as appropriate within identified habitat areas or man-made structures
- Inventory of the number, location, and species of any bird nests on, under or in any structure or bridge
- Assessment of habitat use based on wildlife observations and site conditions
- Confirmation of presence and locations of any species of conservation concern (such as ESA and/ or SARA listings)
- List of plant species observed through the growing season including any significant species
- Description and mapping of Significant Wildlife Habitat

The terrestrial field investigations required for this project included the classification of vegetation communities and search for Species at Risk (SAR) and their habitat within 120 m of the Highway 401/ Power Dam Drive interchange.

A summary of field investigations completed within the Study Area are provided in **Table 1**.

Table 1: Ecological Investigations Overview

Field Investigation	Survey Date(s)
Targeted Butternut Survey	April 21, 2022
Bat Cavity Survey	April 21, 2022
Breeding Bird Survey- Round 1	June 15, 2022
Breeding Bird Survey- Round 2	June 23, 2022
Botanical Inventory	June 23, 2022
Vegetation Community (ELC) Surveys and Delineation	June 23, 2022

4.1 Terrestrial Ecosystems and Existing Conditions

Determining the existing conditions of the Study Area is a prerequisite to assessing the potential environmental impacts associated with the project. Background research and field investigations were coupled with agency consultation to determine the habitat function and significance of wetlands, woodlands, and other wildlife habitats and movement corridors within the Study Area.

4.1.1 Bedrock and Soils

The Study Area is located within the Lake Simcoe-Rideau Ecoregion (Ecoregion 6E), which extends from Lake Huron in the west, to the Ottawa River in the east and includes most of the Lake Ontario shore and the St. Lawrence River Valley in Ontario. It encompasses 6,311,957 ha (6.4%) of the province. The underlying bedrock is comprised of Paleozoic dolomite and limestone from the Ordovician and Silurian ages. The Frontenac Axis (an arch of rock between Algonquin Park and the Adirondacks) is an exemption since the granites and gneisses from the Precambrian age are mixed with Ordovician limestone and sandstone. Most of the bedrock is covered with rolling terrain of ice-laid materials. The eastern portion of the ecoregion is underlain by glaciomarine deposits which are a result of brief post-glacial incursions of salt water from the Champlain Sea along the St. Lawrence valley. The ecoregion is comprised of Gray Brown Luvisols (43%), Melanic Brunisols (27%), Gleysols (14%) and Humo-ferric Podzols (5%). Most of the substrates provide a high capacity to buffer acidic atmospheric deposits before they reach the surface water (Crins, et.al., 2009).

4.1.2 Vegetation Communities

The vegetation communities within the Study Area were classified based on the *Ecological Land Classification for Southern Ontario* (Lee et al., 2008). This system provides a standard for comparing similar communities across Ontario using a multilayer vegetation inventory (canopy, sub-canopy, ground cover), and supports the management of natural resources.

The Study Area, including the Highway 401 and Power Dam Drive Interchange and adjacent 120 m, consisted of a mixture of natural, agricultural and disturbed vegetation communities indicative of past disturbance and nearby rural residential homes with maintained lawns.

Table 2 provides a list and description of the 14 Ecological Land Classification (ELC) communities identified within the Study Area, including dominant plant species occurring within each community. Refer to **Figure 3** for the ELC mapping, and **APPENDIX D** for a plant species list for the Study Area.

Table 2: Ecological Land Classification Ecosites Present Within the Study Area

Ecosite Name	Description of Ecosite (Lee et al., 2008)	Dominant Species within Ecosite (2022 Field Investigations)
CVR Residential	These anthropomorphic areas consist of residential properties and the surrounding maintained landscapes.	Species observed include mowed grass and planted ornamental trees, shrubs, and herbaceous plants.
CVI Transportation and Utilities – Highway	These anthropomorphic areas consist of roads, highways, rights of way (ROW), towers, pipelines, airports, railways, marinas, etc. CVI communities within the Study Area include Highway 401, Power Dam Drive, and adjacent roadways.	Species observed within the highway ROW include Cow Vetch (<i>Vicia cracca</i>), Ox-eye Daisy (<i>Leucanthemum vulgare</i>), Field Hawkweed (<i>Hieracium caespitosum</i> ssp. <i>caespitosum</i>), Bird's-foot Trefoil (<i>Lotus corniculatus</i>), Perennial Sow-thistle (<i>Sonchus arvensis</i> ssp. <i>uliginosus</i>), Canada Goldenrod (<i>Solidago canadensis</i>) and White-sweet Clover (<i>Melilotus alba</i>).
CVC Commercial and Institutional	Commercial and Institutional (CVC) areas consist of commercial and businesses and the surrounding maintained landscapes. CVC areas also consist of abandoned commercial or business structures.	Manicured lawn and ornamental vegetation.
OAG Open Agriculture	Open agricultural crop fields.	Open crop fields (i.e., annual row crops and perennial cover crops)
OAGM4 Open Pasture	Open grasslands that are patchy rather than continuous due to the disturbance of animal grazing.	Dominant species include grazed grasses, Common Yarrow (<i>Achillea millefolium</i> ssp. <i>millefolium</i>), Common Plantain (<i>Plantago major</i>), Canada Thistle (<i>Cirsium arvense</i>) and Red Clover (<i>Trifolium pratense</i>).
IAG Agricultural Infrastructure	Agricultural Infrastructure areas contain infrastructure used for agricultural practices such as buildings, barns, silos etc.	Primarily consists of manicured lawns and OAG communities.
FODM4 Dry-Fresh Upland	Mix of deciduous tree species. Deciduous trees occupy over 75% of the canopy and trees present are usually an indication of disturbance or management.	Species observed include Hawthorn (<i>Crataegus monogyna</i>), Amur Maple (<i>Acer ginnala</i>), Basswood (<i>Tilia americana</i>), White Elm (<i>Ulmus americana</i>), and Riverbank Grape (<i>Vitis</i>

Ecosite Name	Description of Ecosite (Lee et al., 2008)	Dominant Species within Ecosite (2022 Field Investigations)
Deciduous Forest		<i>riparia</i>), and understory consisting of Wild Sarsaparilla (<i>Aralia nudicaulis</i>), and Large-leaved Aster (<i>Eurybia macrophylla</i>).
FODM6 Fresh-Moist Sugar Maple Deciduous Forest	Canopy dominant in Sugar Maple with other deciduous species present in over 75% of the canopy. Dominant species can vary but usually contain Ash species. Moist to fresh moisture regime and mineral substrate present.	Dominant species include Sugar Maple (<i>Acer saccharum</i> ssp. <i>saccharum</i>), Red Maple (<i>Acer rubrum</i>), American Beech (<i>Fagus grandifolia</i>), Basswood, White Elm (<i>Ulmus americana</i>), and Red Ash (<i>Fraxinus pennsylvanica</i>) and understory species include Wild Sarsaparilla, Yellow Trout Lily (<i>Erythronium americanum</i> ssp. <i>americanum</i>), Large-leaved Aster and Sharp-lobed Hepatica (<i>Anemone acutiloba</i>).
FOM Mixed Forest	Community consists of conifer tree species that comprise > 25% of the canopy cover and deciduous tree species that comprise > 25% of the canopy cover.	Species include Red Pine (<i>Pinus resinosa</i>), Sugar Maple, Trembling Aspen (<i>Populus tremuloides</i>) and Tamarack (<i>Larix laricina</i>). Common understory included Virginia Creeper (<i>Parthenocissus quinquefolia</i>), Woodland Strawberry (<i>Fragaria vesca</i> ssp. <i>americana</i>), and Wild Sarsaparilla.
MASM1-1 Cattail Mineral Shallow Marsh	Graminoid shallow marsh dominant in cattail species including Narrow-leaved Cattail and Broad-leaved Cattail in variable proportions. Standing or flowing water is present for much of the growing season. Water present in less than 2 m deep.	Dominant species include Broad-leaved Cattail (<i>Typha latifolia</i>), Narrow-leaved Cattail (<i>Typha angustifolia</i>) and sedge species.
MAMM3 Mixed Mineral Meadow Marsh	Mixed marsh with a combination of forb and graminoid species. This ecosite is characterized by primarily seasonal flooding and is less tolerant of prolonged flooding. Represents the wetland- terrestrial interface.	Species includes Reed Canary Grass (<i>Phalaris arundinacea</i>), Wood Grass (<i>Scirpus cyperinus</i>), Common Water-plantain (<i>Alisma plantago-aquatica</i>), Lady's Thumb (<i>Polygonum persicaria</i>), Scouring Rush (<i>Equisetum hyemale</i> ssp. <i>affine</i>) and sedge species.
MEMM3 Dry-Fresh Mixed Meadow	Vegetation in this community consists of grass-like and broadleaf species primarily. Tree and shrub cover does not exceed 25%. This community is open herbaceous and has cover that varies from scattered and patchy to continuous meadow. Natural areas typically have unique floral	Dominant species includes Cow vetch, Common Yarrow (<i>Achillea millefolium</i> ssp. <i>millefolium</i>), Alsike Clover, Black Medic (<i>Medicago lupulina</i>), Common Evening-primrose (<i>Oenothera biennis</i>), Common Ragweed (<i>Ambrosia artemisiifolia</i>) and Common St. John's-wort (<i>Hypericum perforatum</i>).

Ecosite Name	Description of Ecosite (Lee et al., 2008)	Dominant Species within Ecosite (2022 Field Investigations)
	communities, areas with a cultural legacy, typically dominated by invasive plant species.	
SAM1 Mixed Shallow Marsh	Mixture of emergent and floating aquatic vegetation present. Standing water is always present. Water is less than 2 m deep.	Dominant species includes Narrow-leaved Cattail, Northern Arrowhead (<i>Sagittaria cuneata</i>) and Great Duckweed (<i>Spirodela polyrhiza</i>).
THDM5 Fresh-Moist Deciduous Thicket	Shrub over is greater than 25% and tree cover does not exceed 25%. Substrate consists of mineral soil > 30 cm deep. Tree establishment is inhibited by environment or have been removed by land use practices. Ecosite likely occurs due to recovering from cultural disturbance (e.g., clearing, pasture) and is often found associated with the verges of wetlands.	Dominant species includes Staghorn Sumac, Red-osier Dogwood (<i>Cornus stolonifera</i>) and Wild Red Raspberry (<i>Rubus idaeus</i> ssp. <i>melanolasius</i>).

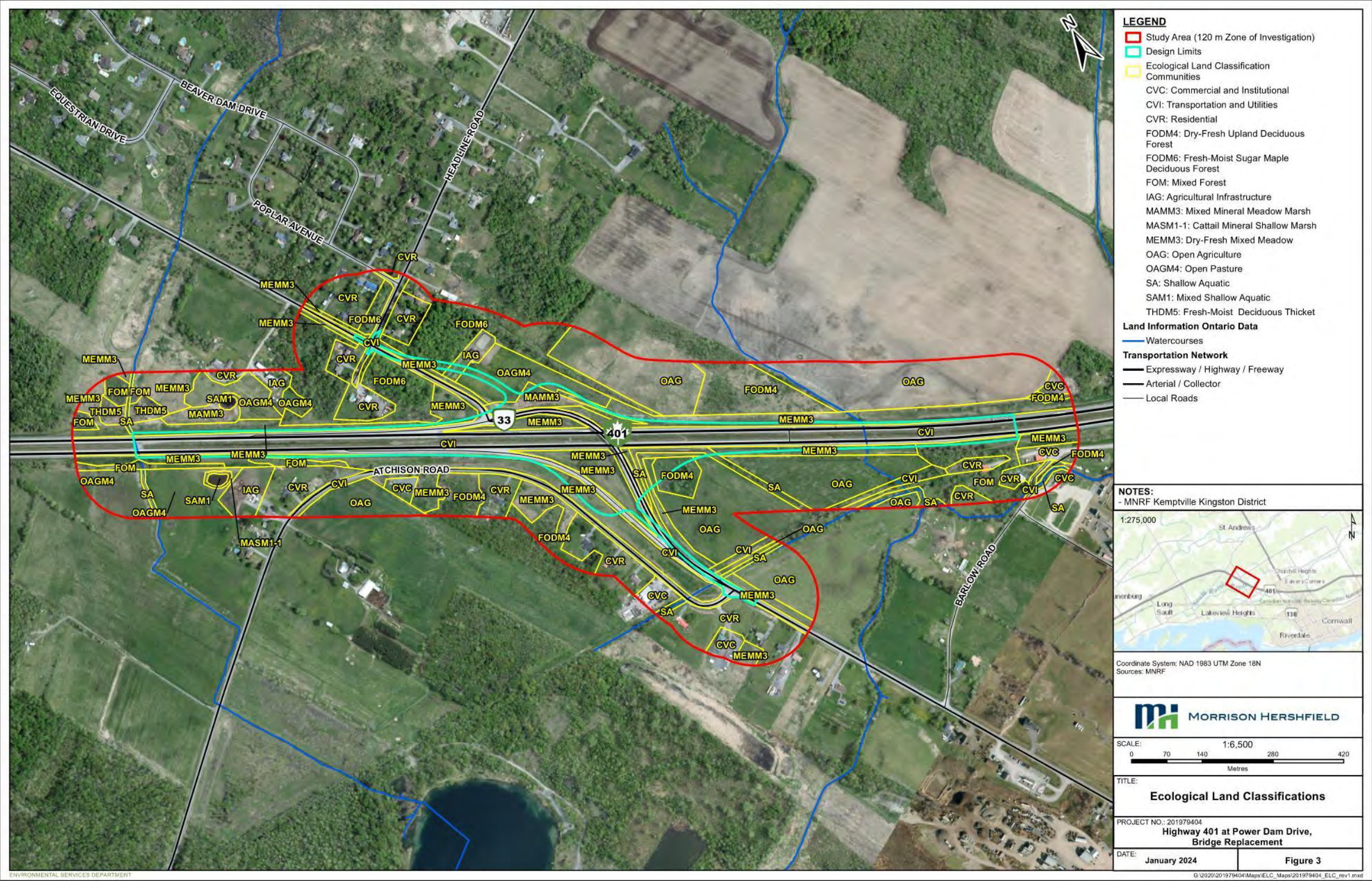


Figure 3: Ecological Land Classifications within the Study Area

4.1.3 Rare Vegetation

Most plant species within the province are given an S Rank (1-5) by NatureServe and used by NHIC to report protection priorities for rare species. Species ranked from S1-S3 are considered rare in the province of Ontario.

Results from background review and NHIC data identified the potential for Butternut (*Juglans cinerea*) to be present within the vicinity of the Study Area. Butternut is provincially Endangered and ranked S2. In order to document occurrences of Butternut within the Study Area, visual surveys were completed during the 2022 field investigations. Information relating to Butternut surveys is further discussed in **Section 4.1.5**.

Correspondence with the MNRF Kemptville District, MTO and RRCA (**APPENDIX B**) did not return additional records of rare flora immediately within or adjacent to the Study Area.

4.1.4 Wildlife

4.1.4.1 Insects

According to the Ontario Butterfly Atlas (OBA), fifty-five (55) butterfly species, including one (1) Species of Conservation Concern, have been recorded within the two (2) 10 km x 10 km atlas squares which encompass the Study Area. Refer to **APPENDIX A** for the complete list of butterflies recorded by the OBA within the Study Area.

Responses from the MNRF, MTO and RRCA did not provide additional records of butterfly species within the surrounding Study Area.

4.1.4.2 Herpetofauna

According to the Ontario Reptile and Amphibian Atlas (ORAA), fourteen (14) herpetofauna species have been recorded within the two (2) 10 km x 10 km atlas squares encompassing the Study Area. The fourteen (14) records for herpetofauna include one (1) snake species, five (5) SAR turtle species and eight (8) amphibians. Refer to **APPENDIX A** for the complete list of herpetofauna recorded by the ORAA surrounding the Study Area.

Responses from the MNRF, MTO and RRCA did not provide additional records of herpetofauna species within the area surrounding the study.

During the field investigations on April 21, 2022, one (1) Eastern Garter Snake (*Thamnophis sirtalis*) was observed within the dry-fresh mixed meadow (MEMM3) community immediately adjacent to the Power Dam Drive overpass north of Highway 401, moving from the top of slope to the bottom toward the mixed mineral meadow marsh (MAMM3). Refer to **APPENDIX C** for photographs of the Eastern Garter Snake.

4.1.4.3 Avifauna

According to the Ontario Breeding Bird Atlas (OBBA), seventy (70) breeding birds have been recorded within the 10 km x 10 km atlas squares encompassing the Study Area, including five (5) SAR. Refer to **APPENDIX A** for the complete list of avian species recorded by the OBBA within the Study Area.

One (1) inactive Eastern Pheobe (*Sayornis phoebe*) nest was observed incidentally, within a box culvert along Highway 401, west of the Power Dam Drive and Highway 401 intersection.

Pileated Woodpecker

On July 30, 2022, Migratory Birds Regulations (MBR) under the *Migratory Birds Convention Act* (MBCA) were updated, where the nests of species in a new Schedule 1 includes those that reuse their nests, and whose nests therefore are protected year-round, and establishes the minimum number of months for which the nest must have been unoccupied by a migratory bird before the protection can be lifted.

Given the preferred habitat requirements (forested communities) and general distribution of Pileated Woodpecker in Ontario, there is a potential for this species to utilize the Study Area during its life cycle for nesting, foraging or roosting purposes. Pileated Woodpecker nests are protected at all times unless monitoring of the nesting cavity for 36 months (3 years) indicates the nest is unoccupied.

Six (6) foraging cavities and one (1) roosting cavity were observed within the Study Area confirming Pileated Woodpecker activity, however foraging and roosting cavities are not protected under the MBCA. One (1) inactive Pileated Woodpecker nesting cavity and one (1) nesting cavity occupied by European Starling (*Sturnus vulgaris*) were observed within the 120 m Preliminary Design zone of investigation during the 2022 field investigations. Both nesting cavities identified fall outside the area of impact and are not likely to be removed based on the Preliminary Design. If these nesting cavities are to be removed during the construction process, notifications must be submitted through the Abandoned Nest Registry and the nests must be monitored for 36 months to confirm abandonment by any migratory bird. The nesting cavity observed east of Power Dam Drive along Highway 401 contained European Starling hatchlings within the cavity. European Starlings and their nests are not protected under the MBCA and therefore, the nest is not considered to be active when this species is occupying it.

In order to confirm the presence of SAR birds within the Study Area, targeted breeding bird surveys were completed within the Study Area.

4.1.4.4 Breeding Bird Surveys

The methods outlined in the *Ontario Breeding Bird Atlas (OBBA) Guide for Participants* (2001) were followed when establishing and conducting the breeding bird surveys. A total of twenty-five (25) breeding bird stations were established for surveying (distanced 200 m apart) along Highway 401 and Power Dam Drive ROW, within the combined six (6) alternative design limits and the 120 m zone of investigation. Breeding bird stations (BBS) 1 and 2 fall outside the

preferred preliminary design footprint, which was selected after the breeding bird surveys were completed.

In accordance with the OBBA *Guide for Participants*, surveys were conducted twice during the breeding bird season, separated by at least fifteen days, on calm mornings with little or no precipitation and minimal winds (1-3 on the Beaufort scale). The recommended time to complete the surveys is between sunrise and 10:00 am; however, with the amount of breeding bird stations required for the project, half of the stations were surveyed between sunrise and 10:00 am on the first day of surveys, and the other half were surveyed between sunrise and 10:00 am on the second day of surveys. The surveys consisted of five-minute point counts where the weather, time, species, breeding evidence and individual bird movement within a 100 m radius were recorded. Species heard outside of the 100 m radius or observed outside of their breeding habitat within the 100 m radius (i.e., flyovers) were recorded separately. The results of the breeding bird surveys are outlined in **Table 3** and breeding bird stations are illustrated in **Figure 4**.

Table 3: Breeding Bird Observations within the Study Area

Common Name	Preferred Breeding Habitat (Audubon, 2023)	Breeding Code* (OBBA, 2001)	Breeding Bird Station (BBS)
American Crow (<i>Corvus brachyrhynchos</i>)	Forest	X	15, 17, 22
American Goldfinch (<i>Carduelis tristis</i>)	Shrubs, Forest	H, X, S	15, 16, 18, 19, 23, 24, 10, 3, 11, 17, 25
American Kestrel (<i>Falco sparverius</i>)	Sparse Forest, Field, Grassland	X	4
American Robin (<i>Turdus migratorius</i>)	Forest, Shrubs	H, X	21, 22, 5, 3, 6, 18, 26
American Woodcock (<i>Scolopax minor</i>)	Thicket, Forest, Field	H	16
Barn Swallow (<i>Hirundo rustica</i>)	Wetland, Field	H, X	19, 17
Black-capped Chickadee (<i>Poecile atricapillus</i>)	Deciduous or Mixed Forest, Thicket	H, S	18, 19, 21, 6, 25
Canada Goose (<i>Branta canadensis</i>)	Field, Open Water	FY	17
Cedar Waxwing (<i>Bombycilla cedrorum</i>)	Forest	H	25, 8, 9, 18
Chipping Sparrow (<i>Spizella passerine</i>)	Shrubs	H	22
Cliff Swallow (<i>Petrochelidon pyrrhonota</i>)	Cliff Face, Field, Wetland	H	17
Common Grackle	Isolated Trees/ Forest	H, X	18, 25, 26

Common Name	Preferred Breeding Habitat (Audubon, 2023)	Breeding Code* (OBBA, 2001)	Breeding Bird Station (BBS)
<i>(Quiscalus quiscula)</i>			
Common Yellow-throat <i>(Geothlypis trichas)</i>	Wetland, Shrubs	H, S	15, 20, 14, 8, 9, 1, 19, 24
Downy Woodpecker <i>(Picoides pubescens)</i>	Forest	CF/A	19
Eastern Kingbird <i>(Tyrannus tyrannus)</i>	Field	X, H	21, 23, 24, 4
Eastern Meadowlark <i>(Sturnella magna)</i>	Grassland	A/H	24
Eastern Phoebe <i>(Sayornis phoebe)</i>	Forest	H	21, 22
European Starling <i>(Sturnus vulgaris)</i>	Isolated Trees/ Forest	X, NY, H	17, 18, 19, 21, 22, 13, 14, 7, 9, 10, 4, 5, 24
Gray Catbird <i>(Dumetella carolinensis)</i>	Shrubs	X, H	5, 3
Hairy Woodpecker <i>(Leuconotopicus villosus)</i>	Forest	H	1
Killdeer <i>(Charadrius vociferus)</i>	Grassland, Wetland	H	16, 17
Merlin <i>(Falco columbarius)</i>	Forest, Grassland	H	14
Northern Cardinal <i>(Cardinalis cardinalis)</i>	Forest	S	15
Oven Bird	Deciduous or Mixed Forest	H	18

Common Name	Preferred Breeding Habitat (Audubon, 2023)	Breeding Code* (OBBA, 2001)	Breeding Bird Station (BBS)
<i>(Seiurus aurocapillus)</i>			
Red-eyed Vireo <i>(Vireo olivaceus)</i>	Deciduous or Mixed Forest	H	26
Red-winged Blackbird <i>(Agelaius phoeniceus)</i>	Wetland	X, P, H, S	16, 17, 18, 19, 20, 21, 22, 13, 23, 24, 25, 7, 8, 9, 10, 11, 12, 6, 4, 3, 1, 26
Rock Pigeon <i>(Columba livia)</i>	Urban	X	18
Rough-winged Swallow <i>(Stelgidopteryx serripennis)</i>	Field, Open Water, Wetland	X, H	19, 21, 17, 16, 23
Savannah Sparrow <i>(Passerculus sandwichensis)</i>	Field	H	13
Song Sparrow <i>(Melospiza melodia)</i>	Shrubs, Field	H, S	16, 19, 20, 21, 22, 13, 23, 25, 26, 14, 7, 8, 12, 5, 6, 3, 9, 10, 18
Turkey Vulture <i>(Cathartes aura)</i>	Thickets, Hollow Trees	X	16, 18, 24
Wild Turkey <i>(Meleagris gallopavo)</i>	Open Forest, Field	H	8
Yellow Warbler <i>(Dendroica petechia)</i>	Shrubs	H, S	16, 26, 8, 5, 25

***Breeding Codes (OBBA, 2001):** X- Species observed in its breeding season (no evidence of breeding), H- Species observed in their breeding season in suitable nesting habitat, S- Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat, P- Pair observed in their breeding season in suitable nesting habitat, A- Agitated behaviour or anxiety calls of an adult, FY- recently fledged young or downy young including young incapable of sustained flight, CF- Adult carrying food for young

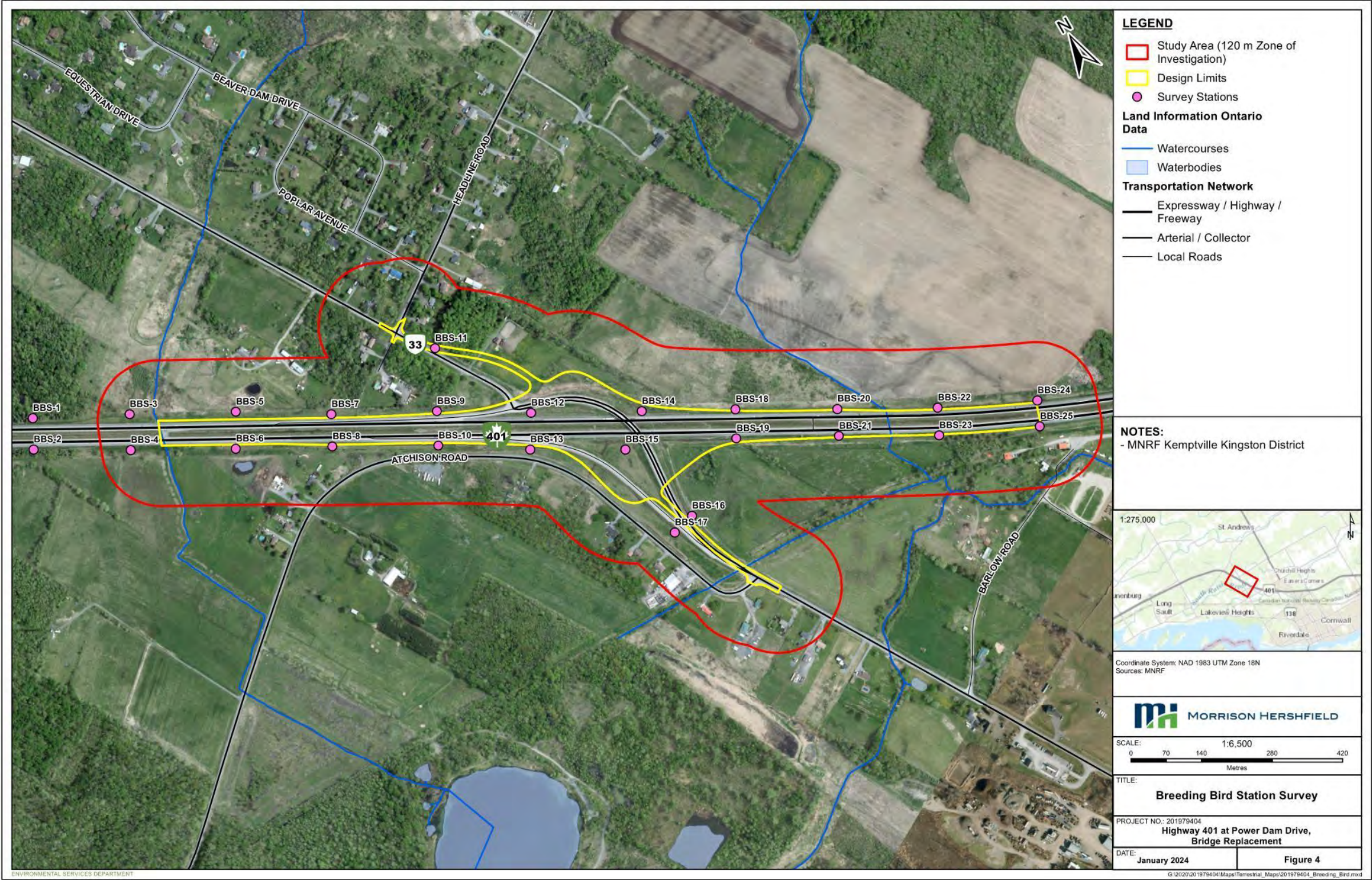


Figure 4: Breeding Bird Survey Stations within the Study Area

4.1.4.5 Mammals

According to species range maps and iNaturalist records, the Study Area is likely to support a variety of mammals that make use of forest and open habitats such as Raccoon (*Procyon lotor*), Eastern Gray Squirrel (*Sciurus carolinensis*), White-tailed Deer (*Odocoileus virginianus*), Eastern Cottontail (*Sylvilagus floridanus*), Coyote (*Canis latrans*), Marten (*Martes americana*) and Red Fox (*Vulpes vulpes*).

During the 2022 field investigations, Eastern Grey Squirrel and a mouse species (*Mus* sp.) were visually observed within the Study Area while Groundhog (*Marmota monax*) burrows and White-tailed Deer scat were also present.

Responses from the MNRF did not provide additional records of mammalian species within the surrounding Study Area.

Four (4) provincially designated Endangered SAR bat species are also known to have ranges that extend into this region (Naughton, 2012), including Northern Myotis (*Myotis septentrionalis*), Eastern Small-footed Bat (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*) and Tri-coloured Bat (*Perimyotis subflavus*). To confirm the presence of potential bat habitat, bat maternity roosting surveys were completed to identify candidate bat cavity trees within the Study Area.

Bat Maternity Roosting Survey

As per the survey protocol for *Species at Risk Bats within Treed Habitat: Little Brown Myotis, Northern Myotis & Tri-colored Bat* (MNRF, 2017), based on *Phase 1: Bat Habitat Suitability Assessment* of the protocol, any coniferous, deciduous, or mixed wooded ecosite that includes trees at least 10 cm in diameter at breast height (DBH) has the potential to be suitable maternity roosting habitat. The Study Area contains deciduous and mixed wood forest communities that meet this criterion. As per *Phase II: Identification of Suitable Maternity Roost Trees* of the protocol, cavity tree surveys were completed in April 2022. All areas within the proposed alternative designs, as well as a zone of investigation extending 15 m from the alternative design limits, were surveyed for maternity roost trees from the publicly accessible MTO ROW; private properties were not accessed for this survey. Trees measuring 25 cm DBH and larger within the Study Area were identified to facilitate Phase III of the protocol: acoustic monitoring.

A total of 16 potential bat cavity trees were identified within the Study Area, including hardwood species with flaking bark. **Table 4** details species, size, height, and decay class of each of the potential bat cavity tree within the Study Area, and **Figure 5** illustrates the locations of each bat cavity tree.

A preliminary assessment of the 16 potential bat cavity trees was completed to identify low, moderate or high-quality cavity trees, based on the most suitable maternity roosting criteria outlined in the Phase III of the protocol (MNRF, 2017):

- Trees measuring 25 cm DBH or greater
- Cavities/ crevices/ cracks were present 10 m or higher
- Trees in early stages of decay (Decay classes 1-3)

It should be noted that the majority of trees identified were present within private property and could not be physically measured due to the surveys being completed from the existing ROW. Further field investigations should be conducted during the detail design phase when access to private property is permitted to confirm the presence of high potential bat cavity trees and the use of forested habitats within the Study Area by SAR bats.

Table 4: Candidate Bat Cavity Tree Results within the Study Area

Bat Cavity Tree ID	Tree Species	DBH (cm)	Tree Height (m)	Decay Class*	Potential Roost Features	Potential Roost Usage* (Low, Moderate or High)	Approximate GPS Coordinates (Latitude and Longitude)
BCT-01	American Basswood (<i>Tilia americana</i>)	40	15	2	Cavity located in the middle dead codominant stem 13 m from base of trunk, some loose bark also present	Low	45.0619703, -74.8121689,
BCT-02	American Basswood (<i>Tilia americana</i>)	50	13	4	Tree located approximately 7 m from fence line; standing snag with cavities at 9 m, 12 m and 13 m from base of trunk. Tree adjacent to sugar maples.	Moderate	45.0618302, -74.8118248
BCT-03	American Beech (<i>Fagus grandifolia</i>)	25	12	2	Tree located approximately 9 m from fence line, cavities present along length of trunk at 5 m and 6 m from base.	Moderate	45.0616905, -74.8118347
BCT-04	American Basswood (<i>Tilia americana</i>)	35	20	3	Tree located approximately 15 m from fence line. One (1) cavity from fallen limb, one (1) cavity at top of canopy.	Low	45.0617032, -74.8118837
BCT-05	American Basswood (<i>Tilia americana</i>)	25	18	1	Tree located approximately 10 m from fence line, crack and cavity situated 8 m up trunk.	Low	45.0617544, -74.81178
BCT-06	American Basswood (<i>Tilia americana</i>)	25	18	3	Tree located approximately 7 m from fence line, cavities present at 5 m, 6 m, and 13 m from base of trunk. Main leader in canopy dead.	Low	45.0616066, -74.8117713
BCT-07	Sugar Maple (<i>Acer saccharum</i>)	30	15	2	Tree located approximately 6 m from fence line, long narrow crack along co-dominant stem leaning south 5 m from base of trunk.	Low	45.061501, -74.8117542
BCT-08	American Basswood (<i>Tilia americana</i>)	50	10	4	Tree located approximately 7 m from fence line, multiple deep cavities (woodpecker holes) along length of trunk	Moderate	45.061416, 74.8121101
BCT-09	American Basswood (<i>Tilia americana</i>)	45	20	2	Tree located approximately 3 m from fence line, deep cavity at 10 m from base of trunk.	Low	45.0614882, -74.8121353,
BCT-10	American Basswood (<i>Tilia americana</i>)	30	20	2	Tree located approximately 10 m from fence line, multiple cavities between 4 m and 10 m along the trunk from base of tree.	Moderate	45.0615336, -74.8121906,
BCT-11	American Beech (<i>Fagus grandifolia</i>)	60	12	5	Tree located approximately 1 m from fence line with multiple cavities along length of trunk.	Moderate	45.0622219, -74.8128072,
BCT-12	White Ash (<i>Fraxinus americana</i>)	45	15	2	Tree located approximately 7 m from fence line, with multiple cavities along length of trunk.	Low	45.061673, -74.8123056,
BCT-13	White Ash	51	16	4	Tree located approximately 10 m from fence line, two (2) cavities located along trunk.	Low	45.0556726, -74.7987898,

Bat Cavity Tree ID	Tree Species	DBH (cm)	Tree Height (m)	Decay Class*	Potential Roost Features	Potential Roost Usage* (Low, Moderate or High)	Approximate GPS Coordinates (Latitude and Longitude)
	(<i>Fraxinus americana</i>)						
BCT-14	American Beech (<i>Fagus grandifolia</i>)	50	12	3	Tree located approximately 2 m from fence line, two (2) cavities located along trunk.	Low	45.0622143, -74.8128062
BCT-15	American Elm (<i>Ulmus americana</i>)	45	15	4	Tree located approximately 5 m from fence line, one (1) large cavity located along trunk.	Low	45.0616716, -74.8118904,
BCT-16	White Ash (<i>Fraxinus americana</i>)	45	10	4	Tree located approximately 9 m from fence line, multiple cavities along length of trunk.	Moderate	45.0618881, -74.8124822,

*Decay Class: Scale of 1-6, 1 being healthy, 6 being very old/ dead.

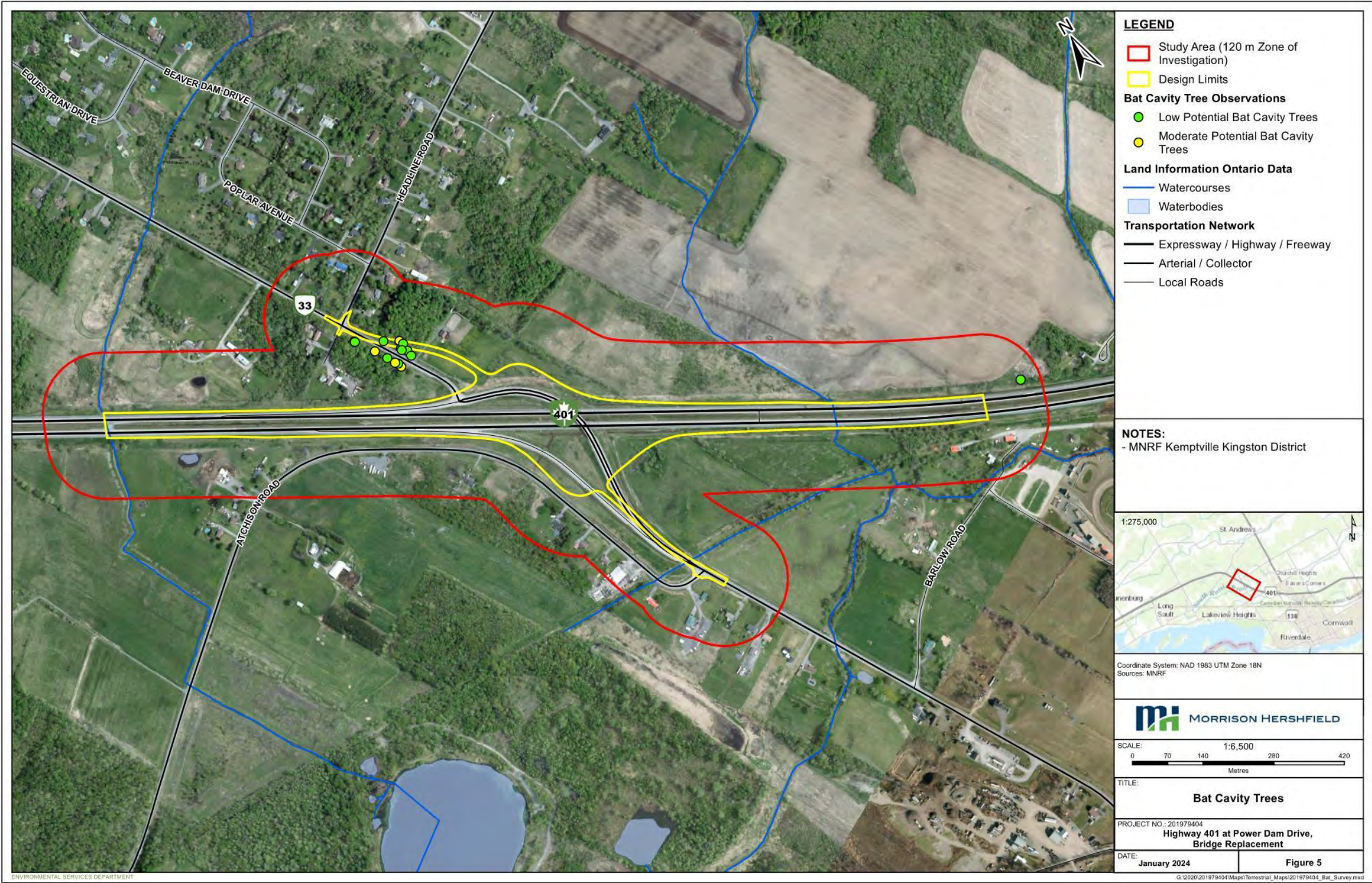


Figure 5: Bat Cavity Tree Locations within the Study Area

4.1.5 Species at Risk

Background data collected within the Study Area identified records of 10 provincially designated Endangered or Threatened SAR likely to occur within the general Study Area based on background review, existing conditions on site, and the known habitat preferences for the following SAR:

Threatened:

- Blanding's Turtle (*Emydoidea blandingii*)
- Bobolink (*Dolichonyx oryzivorus*)
- Eastern Meadowlark
- Least Bittern (*Ixobrychus exilis*)

Endangered:

- Black Ash (*Fraxinus nigra*)
- Butternut
- Northern Myotis
- Eastern Small-footed Bat
- Little Brown Myotis
- Tri-coloured Bat

During the 2022 field investigations, one (1) Eastern Meadowlark, a provincially designated Threatened SAR was observed within the Highway 401 and Power Dam Drive interchange. One (1) Butternut, a provincially designated Endangered SAR, was observed near the western limits of the Study Area within the mixed forest (FOM) community adjacent to open pasture (OAGM4) habitat. Additionally, potential habitat for bat maternity colonies may be present within the Study Area, as bat cavity trees were identified. Regulations regarding these species, and relevant mitigation measures are further discussed in **Section 5** and **Section 6**.

4.1.5.1 Butternut Tree Surveys

A targeted survey for Butternut was completed within the combined limits of the six (6) alternative designs (prior to preferred design selection) on April 21, 2022, from the MTO right-of-way. A 25 m surveying offset from the Preliminary Design limits was applied to the targeted survey as the ESA regulates the habitat of a Butternut within the area 25 m from its stem.

One (1) Butternut measuring 1 cm diameter at-breast-height (DBH) was identified during the field investigations on April 21, 2022, just outside the northwest limits of the preferred design footprint within the mixed forest (FOM) community adjacent to open pasture (OAGM4) habitat. The Butternut was observed approximately 180 m west of the preferred Preliminary Design limits along Highway 401, therefore registration under the ESA is not required; however, if the detail design changes such that the proposed works will interfere with the 25 m regulated habitat for Butternut, further field investigations will be required, including a Butternut Health Assessment, to determine its classification under the ESA regarding whether the individual is

retainable or non-retainable. This assessment will dictate which registration is required under the ESA.

It should be noted that observations were limited to those made from the existing ROW within the Study Area, and that further field investigations for Butternut may be warranted during detail design within private properties where permission to enter was not available for the preliminary surveys.

APPENDIX E provides a detailed description of provincially and federally designated SAR with the potential of occurring within and surrounding the Study Area. **Figure 2** displays the locations of SAR identified during the 2022 field investigations.

4.1.5.2 Black Ash

In 2022, Black Ash was listed as an Endangered species under the ESA, though species protections were temporarily suspended until January 2024. Ontario Regulation (O.Reg) 6/24 summarizes the protection of Black Ash under the ESA, and protects Black Ash only situated within the municipalities listed under Schedule 1, which includes the United Counties of Stormont, Dundas and Glengarry (i.e., the Study Area).

The regulation specifies if a Black Ash measuring 8 cm diameter at breast height (DBH) and greater is identified within the areas listed in Schedule 1, a 30 m radial distance from the stem is of every tree is protected.

Black Ash were not identified during the 2022 field investigations; however, observations were limited to those made from the existing ROW within the Study Area, and that further field investigations for Black Ash may be warranted during detail design within private properties where permission to enter was not available for the preliminary surveys.

4.2 Designated Significant Natural Areas

Designated Significant Natural Areas are defined by resource agencies, municipalities, or the provincial and/ or the federal governments as natural areas which have special or unique ecological, recreational, or aesthetic values or functions.

According to the Natural Heritage Information Centre (NHIC) and Land Information Ontario (LIO), there are no Areas of Scientific Interest (ANSI's), or Provincially Significant Wetlands (PSW) within the Study Area; however, there are several unevaluated wetlands within the Study Area limits. Unevaluated wetlands are wetlands that have not yet been evaluated using the Ontario Wetland Evaluation System, with the results reviewed by the MNRF.

Two (2) significant woodlands also exist within the Study Area as identified through LIO and the townships Official Plan - Schedule B2 (SDG Counties, 2018b). Significant woodlands are designated under municipal Official Plans with the intent to conserve woodlands. Significance is determined using *Natural Heritage Reference Manual* (MNRF, 2005) criteria and is based on the Environment Canada guidelines to sustain wildlife habitat and ecological services such as flood attenuation and soil retention (SDG Counties, 2018b). The design footprint does not

encroach on these significant woodlands; however, they are located within the 120 m zone of investigation (see **Figure 2**).

4.3 Significant Wildlife Habitat

A SWH screening exercise was conducted using the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E* (MNRF, 2015) to determine the presence of Candidate SWH within the Study Area. The criteria schedules are intended to be used during development projects to identify and protect SWH in the planning process.

The four (4) categories of SWH within Ecoregion 6E include:

- Seasonal Concentration Areas
- Rare Vegetation Communities or Specialized Habitat for Wildlife
- Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)
- Animal Movement Corridors

The following sections discuss each Significant Wildlife Habitat and confirm the presence of candidate habitat within the Study Area based on the results of the background review and 2022 field investigations.

4.3.1 Seasonal Concentration Areas

Some species of animals gather from geographically wide areas at certain times of the year. This could be to hibernate or to bask (e.g., some reptiles and bats), over-winter (e.g., deer yards), or to breed (e.g., bird breeding colonies). Maintenance of the habitat features that result in these concentrations can be critical in sustaining local or even regional populations of wildlife. Based on information collected during the 2022 field investigations, the following seasonal concentration areas may be present:

- **Candidate Bat Maternity Colonies** may be present in the forested communities (FOM, FODM4, FODM6) within the Study Area, where large diameter deciduous trees (>25 cm DBH) are located. During the 2022 spring bat cavity searches, sixteen (16) potential bat maternity roosting trees were identified throughout the forested habitats.
- **Reptile Hibernaculum** may be present near the footings of the Power Dam Drive overpass, as one (1) Eastern Garter Snake was observed moving immediately adjacent to the top of slope north of Highway 401 during the April 21 field investigation, which is during the range of dates that snakes typically exit hibernacula. According to the SWH 6E criteria, presence of snake hibernacula is confirmed with the presence of five (5) or more snake individuals of the same species, or presence of two (2) different snake species near a potential hibernaculum. It is understood that snakes are known to use anthropogenic structures with abandoned and crumbling foundations as hibernacula and not highway structures; however, with the observation of the Eastern Garter Snake during early spring, there is a possibility of overwintering habitat within the vicinity of the road structures.

4.3.2 Rare Vegetation Communities and Significant Habitat for Wildlife

Rare Vegetation Communities often contain unique species, particularly plants, which depend on specialized habitats for survival and cannot readily move or find alternative habitats.

According to the *Significant Wildlife Habitat Criteria Schedule for Ecoregion 6E*, there were no significant habitat areas within the Study Area for rare vegetation communities.

Specialized Habitat for Wildlife can include old-growth forests, calving areas for moose, cliffs, and habitat for bird species requiring large blocks of habitat (generally greater than 25 ha in size). Based on information collected during field investigations, the following specialized habitat for wildlife areas may be present within and/ or adjacent to the Study Area:

- **Candidate Woodland Raptor Nesting Habitat** may be present within the forested communities (FOM, FODM4 and FODM6) as stick nests may be constructed within the large trees dominating the forest canopies. No raptor nests were observed during the 2022 field investigations.
- **Candidate Amphibian Breeding Habitat (Wetlands)** maybe be present in the Shallow Aquatic (SA) ponds or marsh (MASM1-1 and MAMM3) communities found throughout the Study Area. No amphibian species were observed within these habitats during the 2022 field investigations.

4.3.3 Habitat for Species of Conservation Concern

Species of Conservation Concern includes species that may be locally rare or in decline, but that have not yet reached the level of rarity that is normally associated with “Endangered” or “Threatened” designations under the ESA and/ or SARA. Rare wildlife status is based on species listed as Special Concern under the ESA, Global Rank (G-rank) or Provincial Rank (S-rank) status, identified through the National Heritage Information Centre. The *Significant Wildlife Habitat Technical Guide* (MNRF, 2000) suggests that the highest priority for protection should be provided to habitats of the rarest species (on a scale of global through to local municipality); it also states that habitats that support large populations of a species of concern should be considered significant.

4.3.3.1 Special Concern and Rare Wildlife Species

Based on the background review and 2022 field investigations, eight (8) species provincially designated as special concern and one (1) provincially rare species have the potential to be present within the general vicinity of the Study Area:

Special Concern:

- Barn Swallow
- Eastern Wood-pewee (*Contopus virens*)
- Eastern Musk Turtle (*Sternotherus odoratus*)
- Monarch (*Danaus plexippus*)
- Northern Map Turtle (*Graptemys geographica*)

- Snapping Turtle (*Chelydra serpentina*)
- Wood Thrush (*Hylocichla mustelina*)

Provincially Rare (S1-3, SH):

- Common Gallinule (*Gallinula galeata*)

Monarch butterflies may forage on nectar producing plants within the ROW and dry meadow communities (MEMM3). Wood Thrush and Eastern Wood-pewee may find nesting and breeding habitat within the mixed and deciduous forested communities (FOM, FODM4 and FODM6) within the Study Area. Common Gallinule may nest near the water edge in marshes lakes and ponds with emergent vegetation such as the marsh communities within the Study Area (MASM1-1, SAM1 and MAMM3).

Three (3) Barn Swallow individuals were observed foraging within the Study Area during the 2022 field investigations. Nesting habitat was present within the Study Area including in anthropogenic structures such as bridges and culverts; however, Barn Swallow nests were not observed.

There is low likelihood for turtle species to be present within the shallow aquatic (SA) ponds found within the Study Area as these features are limited in size and isolated from watercourse influences.

4.3.4 Animal Movement Corridors

According to the guidelines for Ecoregion 6E and to the Significant Wildlife Habitat Technical Guidelines for Ecoregion 6E (MNRF, 2015), the following potential Animal Movement Corridors may be present:

- **Candidate Amphibian Movement Corridor** may be present within the marsh communities (MASM1-1, SAM1 and MAMM3) within the Study Area; however, these features are often adjacent to ROW and agricultural communities which do not provide preferred corridor movement habitat (forests) for amphibians.
- **Candidate Deer Movement Corridors** may be present in the forested communities (FOM, FODM4 and FODM6) within the Study Area, as White-tailed Deer will use corridors found in all treed ecosites. White-tailed Deer scat was observed within the Mixed Forest (FOM) during the April 22, 2022, field investigations.

5. PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS

Based on the Preliminary Design, the proposed interchange at Highway 401 and Power Dam Drive (G.W.P. 4092-19-00) will involve construction of new on/off ramps, as well as re-alignment of Power Dam Drive in the vicinity of the new bridge crossing. The existing environmental site conditions within the Study Area were evaluated against the Preliminary Design to assess any potential direct and indirect impacts to sensitive terrestrial or aquatic features and/ or SAR.

Figure 6 illustrates the Preliminary Design overlayed on the existing vegetation communities confirmed during 2022 field investigations.

An overview of the assessment of potential impacts to existing ecological features within the Study Area is discussed in the following sections.

5.1 Loss of Vegetation and Terrestrial Habitat

The Preliminary Design will require the clearing of approximately 5.25 ha of land for the interchange modifications needed for the project. Construction activities that have the potential to impact the vegetation and terrestrial communities within the Highway 401 and Power Dam Drive Study Area include vegetation clearing and disturbance to vegetated areas as a result of road construction and road re-alignment. Further vegetation removals may be identified during the detail design phase of the project, such as removals for equipment access and/ or storage of materials.

It is anticipated that the permanent removal of vegetation will be required to accommodate the proposed road construction and realignment activities at the interchange. Based on the Preliminary Design, removal of mature trees, shrubs and herbaceous vegetation will be required within the forest and meadow communities. Transportation and Utilities (CVI) areas are already developed and not typically considered vegetation communities. See **Figure 5** for the anticipated areas of impact on ELC communities within the Study Area.

5.2 Potential Disturbance to Significant Natural Areas

Results of the background review did identify two (2) significant woodlands within the Highway 401 and Power Dam Drive Study Area based on LIO data and the United Counties of Stormont, Dundas, Glengarry *Official Plan*. The significant woodlands identified are located within the 120 m zone of investigation but outside the area of impact for the Preliminary Design. Direct impacts to these woodlands are not expected to occur; however, indirect impacts resulting from construction including noise, dust, vibration, stockpiled materials, and erosion all have the potential to indirectly impact wildlife species. These indirect impacts can be diminished through the implementation of standard mitigation measures further described within this report.

5.3 Potential Disturbance to Significant Wildlife Habitat

As noted in **Section** Error! Reference source not found., several candidate SWH features were identified within or adjacent to the Preliminary Design footprint. A high-level assessment of the Study Area habitat's connectivity with other features or as part of a larger feature determined that the candidate SWH features are extensive in size and are not limited to the existing Study Area. Where SWH may exist within the Study Area (e.g., bat maternity roosting habitat), the larger forested communities outside the Study Area are quite similar based on the high-level assessment and likely have the ability to support wildlife/ SAR within the Study Area following development.

Indirect impacts resulting from construction may occur but can be diminished through the implementation of standard mitigation measures as described within this report.

5.4 Potential Disturbance to General Wildlife and Migratory Birds

Several wildlife species, including birds protected under the MBCA, were observed during the field investigations and have been recorded in the area as confirmed through background data review. Potential direct impacts associated with the Preliminary Design to general wildlife and migratory birds within the Study Area include vegetation removals required for road construction and realignment activities. In addition, construction noise, dust, and vibration have the potential to indirectly impact a variety of wildlife occurring within the general Study Area, including migratory birds.

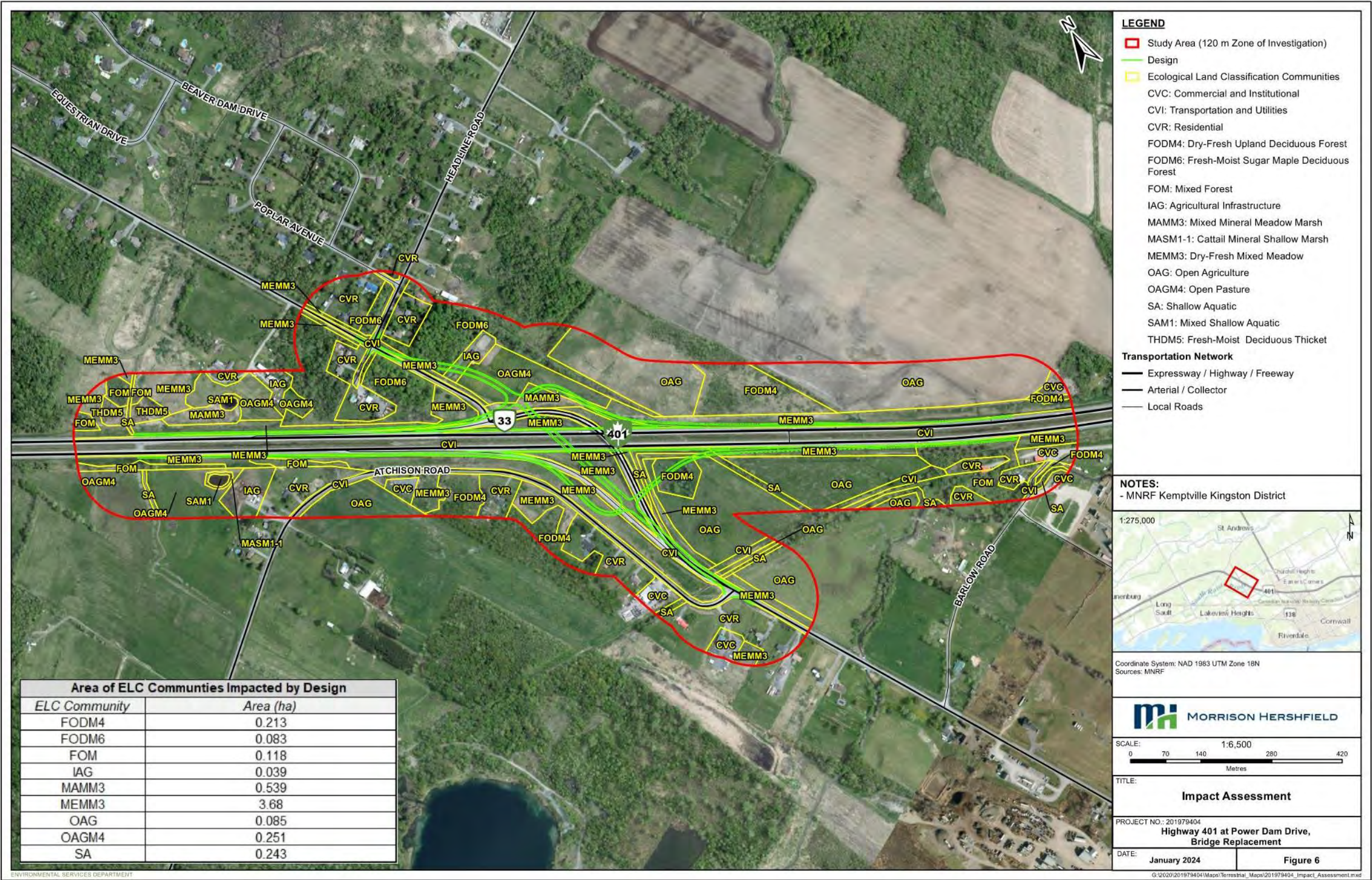


Figure 6: Power Dam Drive and Highway 401 Area of Impact Based on the Preferred Alternative Design

5.5 Potential Disturbance to Species at Risk

Components of the Preliminary Design that have the potential to impact SAR include the vegetation removal required for the interchange modifications within the open agriculture, meadow, and forested communities within the Study Area.

5.5.1 SAR Vegetation

As previously stated, one (1) Butternut measuring 1 cm diameter at-breast-height (DBH) was identified during the field investigations on April 21, 2022, just outside the northwest limits of the preferred design footprint within the mixed forest (FOM) community adjacent to open pasture (OAGM4) habitat. The Butternut was observed approximately 180 m west of the western design limits along Highway 401, therefore registration under the ESA is not required for this individual.

It should be noted that vegetation observations were limited to those made from the existing ROW within the Study Area, and that further field investigations for SAR species (i.e., Butternut and Black Ash) may be warranted during detail design within private properties where permission to enter was not available for the preliminary surveys.

5.5.2 SAR Bats

As previously stated, SAR bats have the potential to use trees within the forested communities (FOM, FODM4, FODM6) throughout the Study Area, as they can be present within any treed ecosite in Ontario. Targeted cavity tree surveys were completed within the Study Area, including the 120 m buffer to identify potential maternity roosting trees for SAR bats. 16 potential maternity roosting trees were identified, and eight (8) fall within the interchange modification area. It is unlikely that the tree removals required within the design will impact SAR bat individuals (if present) as there are likely alternative cavity trees within the surrounding and connected forest communities.

5.5.3 SAR Birds

As previously stated in **Section 4.1.5**, Bobolink and Eastern Meadowlark foraging and breeding habitat is present within the agricultural communities situated within the Study Area. Habitat for Least Bittern includes expansive wetlands which were not present within the Study Area.

One (1) Eastern Meadowlark was observed within the open agriculture (OAG) community, southeast of the proposed interchange. The footprint of the Preliminary Design falls within a small section of the agricultural field in which the Eastern Meadowlark was observed.

Eastern Meadowlark is a provincially Threatened species and is afforded general habitat protection under the ESA. General habitat for Eastern Meadowlark is categorized as follows (MECP, 2021):

- Category 1: The Eastern Meadowlark nest and area immediately surrounding nest (i.e., 10 m). This area is highly sensitive and has the lowest tolerance to alteration.

- Category 2: The area between 10 m and 100 m of the nest or approximate defended territory. This area has a moderate level of tolerance to alteration.
- Category 3: The area between 100 m and 300 m of the nest or approximate defended territory. This area has the highest level of tolerance to alteration.

Due to the confirmed presence of Eastern Meadowlark and observed calls of anxiety, permanent impacts to this species within Category 3 habitat is anticipated as a result of the interchange modification works. As this species is protected under the ESA, appropriate avoidance and mitigation measures will be required to protect this SAR and its habitat. In addition, if the pertinent design elements stay the same in detail design, it is likely that a Notice of Activity (NOA) form will need to be prepared and submitted to the MECP through the Environmental Registry prior to construction start to receive a conditional exemption under Part IV of O.Reg. 830/ 21.

Recent changes to the ESA legislation have provided a streamlined registration process for several SAR, including Eastern Meadowlark. Upon submitting a NOA form, the Proponent may now choose to satisfy all the conditions that are required for the species exemption under Ontario Regulation 830/ 21 or pay a species conservation charge in lieu of completing beneficial actions required under the conditional exemption to the Species at Risk Conservation Trust. The Proponent calculates the cost of the conservation charge based on the formula presented in O.Reg. 829/ 21 and is required to be paid at least one day before the activity begins or within 30 days after registering the activity, whichever is earlier. Regardless of which option the Proponent selects to move forward with an exemption under the ESA, potential impacts to SAR still need to be minimized as required (e.g., conducting work outside of the Eastern Meadowlark breeding period).

If the detail design requires revisions and encroaches further into the agricultural field, additional assessment would be required to determine potential impacts to Eastern Meadowlark.

5.5.4 SAR Reptiles

Blanding's Turtle prefer large open wetlands or riverine habitats for their lifecycle. Based on the isolated ponds and agricultural fields within the Study Area, it is unlikely that Blanding's Turtle are within the immediate Study Area, and will not be impacted by construction works.

Adherence to appropriate mitigation measures and wildlife timing windows will reduce the risk of potential impacts to SAR reptiles from the proposed construction activities.

6. MITIGATION MEASURES

Activities associated with the Highway 401 and Power Dam Drive interchange have the potential to impact existing terrestrial habitat and SAR within the Study Area if appropriate mitigation measures are not implemented. Activities undertaken in relation to the project will follow the ESA, MBCA, *Fish and Wildlife Conservation Act* (FWCA), the *Environmental Protection Requirements for Transportation Planning and Highway Design, Construction, Operation and Maintenance* (MTO 2014), and the *MTO Best Management Practices for Species at Risk Protection During Maintenance Activities* (MTO 2017) as well as all other relevant standards (e.g., OPSS) policies, regulations, and Acts.

It is anticipated that vegetation clearing, including trees and shrubs, will be required for the road construction and realignment, and bridge replacement for the Highway 401 and Power Dam Drive interchange within and outside of the ROW, resulting in permanent impacts to the forested, open agriculture and meadow communities identified within the Study Area. The following mitigation measures are proposed to reduce the risk of impacts to the terrestrial ecosystems and general wildlife within the Study Area.

6.1 Vegetation Clearing

It is anticipated that vegetation clearing, including trees and shrubs, will be required for the interchange modification. Clearing of vegetation should be kept to a minimum whenever possible, and existing trails, roads or cut lines should be used to avoid disturbance to vegetation and prevent soil compaction. The following additional mitigation measures to reduce the risk of impacts to terrestrial communities and vegetation on site are recommended:

- All vegetation removals and tree clearing shall be completed in accordance with **OPSS 201: Construction Specification for Clearing, Close Cut Clearing, Grubbing, and Removal of Surface and Piled Boulders**.
- Surplus material resulting from vegetation removal operations shall be managed according to **OPSS 180: General Specification for the Management of Excess Materials**
- In the event of accidental damage to trees or unexpected vegetation removal, vegetation shall be replaced/ restored with native species according to **Non-Standard Special Provision (NSSP) LAND0001 Requirements for Planting**
- Disturbed vegetation/ soils within the impacted areas shall be re-established as soon as weather/ conditions permit to provide stabilization to exposed soils and minimize sedimentation according to **OPSS 206 Construction Specification for Grading and OPSS 802 Construction Specification for Topsoil**
- Following completion of grading and topsoil application, disturbed areas will be re-seeded with a standard roadside seed mixture for the Highway 401 and Power Dam Drive ROW, as specified in **OPSS 803 Construction Specification for Vegetative Cover**
- During ditching works, any tree roots greater than 25 mm in diameter shall be cut off cleanly according to **OPSS 801 Construction Specification for the Protection of Trees**

- Due to the presence of Invasive Phragmites in areas flagged for vegetation removals, **NSP NSTI-06: Invasive and Noxious Vegetation Disposal and Burial**.
- Vegetation removal shall be minimized, where possible, and shall be limited within the construction footprint.

6.2 Wildlife and Wildlife Habitat

Construction activities that have the potential to impact wildlife and wildlife habitat include:

- Noise during construction
- Temporary and permanent loss of wildlife habitat due to vegetation removal (permanent removal of mature trees and shrubs, temporary grading of herbaceous species that are expected to regenerate following the application of seed mixes).

Most wildlife species will move away from noise and disturbance during construction activities. However, some wildlife species may remain within the work limits if they are sessile or seek refuge. As per **NSSP No. 001A860: Prevention of Wildlife Harassment**, no wildlife encountered during construction may be harassed or killed. Therefore, if any wildlife is encountered within the work limits that do not, or cannot, move away safely on their own, they should be moved to a similar, safe location outside of the work area by a qualified biologist/ecologist. It is noted that SAR species and migratory birds receive additional protection and mitigation measures as detailed in this report.

Nesting migratory birds are protected under the MBCA. The following mitigation measures are recommended to reduce the risk of impacts to migratory birds protected under the MBCA:

- The Contractor is responsible for abiding by **NSSP OC_EN_03: Migratory Bird Protection** and will not destroy active nests or eggs of protected migratory birds. As such, all vegetation removals and clearing should be completed outside of the active breeding bird season, which begins April 15 and ends August 31 of any given year.

If nesting activity (nest building, carrying nesting material etc.) and/ or nests or eggs/ young are found, all activity in the area should temporarily cease, until the Contractor retains an Avian Biologist to determine whether the nests/ eggs/ young belong to a migratory bird species. Any nests found belonging to migratory birds must be protected while they are active with a species appropriate buffer (determined by the avian biologist), within which no work can occur until such a time that the nest is no longer active.

6.3 Species at Risk

Based on information collected during the background review, ten (10) Endangered or Threatened SAR protected under the ESA were recorded within the general vicinity of the Study Area, including Blanding's Turtle, Bobolink, Eastern Meadowlark, Least Bittern, Black Ash, Butternut and four bat species; however, only Eastern Meadowlark (individual and habitat), and potential SAR bat roosting trees were recorded during the 2022 field investigations. These species should therefore be considered for future mitigation measures.

To minimize the potential of directly impacting bird and bat SAR during construction, vegetation removal (including trees and shrubs) within the Study Area shall be completed outside of both the active bat season (April 1 – September 30) and the breeding bird window (April 15 – August 31).

If the contractor encounters a SAR within the work limits at any time that is likely to be impacted by the operations:

- The Contractor shall immediately notify the Contract Administrator and suspend operations within the area identified by the Contract Administrator, as per **OPSS PROV 100: MTO General Conditions of Contract**. Work shall remain suspended within that area until otherwise directed by the Contract Administrator in writing.

6.3.1 SAR Birds

Eastern Meadowlark, a provincially designated Threatened SAR bird, was confirmed on-site during the 2022 field investigations, as an individual adult was observed during the breeding bird survey in suitable nesting habitat and was displaying agitated behaviour and anxiety calls. The mitigations outlined in O.Reg 830/ 21, Section 15 should be followed and includes completing the proposed work within Eastern Meadowlark habitat outside of their breeding period (May 1 to July 31 of any given year). Additional avoidance and mitigation recommendations shall be implemented during detail design as documented in **NSSP ENVR007: Protection of Species at Risk**.

6.4 Erosion and Sediment Control

Disturbed soils will be properly contained to prevent migration of materials and sediments beyond the work limits and into adjacent communities using **OPSS-804: Construction Specification for Temporary Erosion Control**, and **NSSP 001A820 (Operational Constraint – Erosion and Sedimentation Control)**.

6.5 Contaminant and Emergency Spill Response

For the proposed works within the Highway 401 and Power Dam Drive Study Area, the Contractor must develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance as well as keep emergency spill kits on site (and in heavy machinery) in case of emergency.

All reportable spills (as designated by relevant legislation) shall be reported to the Ministry of Environment, Conservation and Parks (MECP) Spills Action Centre (1-800-268-6060), as well as to DFO and MNRF Kemptville District if there is potential for impacts to natural areas, fisheries, or wildlife resources.

7. AUTHORIZATIONS, APPROVALS, AND NEXT STEPS

Section 9 (Species Protection) and Section 10 (Habitat Protection) of the ESA stipulate the protection of listed SAR and their habitat. Where specific legislated requirements are met, the ESA enables the Minister to issue a permit to a proponent that authorizes them to engage in an activity that would otherwise be prohibited by Section 9 or 10 of the Act.

The Information Gathering Form and Avoidance Alternative Form is available for Proponents to present information to the Ministry regarding the presence of SAR within the Study Area, potential effects of the activity to SAR and their habitat, and to outline the proposed alternatives to avoid impacts to SAR and their habitat as a result of the Project. Upon submission, MECP will consider the information provided in the forms and assess whether or not the avoidance and mitigations proposed will avoid adverse effects to SAR and their habitat. The MECP will notify the proponent if the proposed alternatives are sufficient to avoid adverse effects to SAR and their habitat to proceed with the proposed activity without acquiring a permit.

Eastern Meadowlark

Construction works required for the interchange modification includes the construction of new roads, and general road realignment, which will directly impact Category 3 nesting habitat for Eastern Meadowlark. Field investigations in 2022 identified Eastern Meadowlark nesting habitat based on an individual observed during the breeding bird survey and agitated behaviour calls of anxiety observed. Eastern Meadowlark nests are rarely identified due to their cryptic nature; therefore, observations of adult breeding and nesting behaviours are used as evidence. Since Eastern Meadowlark habitat will be impacted by the proposed project works, a conditional exemption under O.Reg. 830/ 21 is required prior to construction. Proponents have the ability to choose to complete the conditional requirements listed under Part IV of O.Reg. 830/ 21 or submit a payment to the SAR Conservation Trust in lieu of completing species beneficial actions. As the SAR Conservation Fund is a new legislative process, consultation with the MECP is recommended to ensure appropriate steps are taken to protect SAR and their habitat within the Study Area.

8. CONCLUSION

The project works proposed for the Highway 401 and Power Dam Drive interchange will require the construction of new roads and general road realignment within the Study Area. Assuming the mitigation measures outlined in this report are implemented and adhered to, it is anticipated that direct and indirect impacts to potential SAR and general wildlife during the construction phase of the project will be minimized to the greatest extent possible. The following list provides an overall review of site-specific information gathered from the background review, agency consultation and 2022 field investigations completed within the Study Area:

- A total of 10 provincially Threatened or Endangered species have the potential to occur within the general vicinity of the Study Area.
- One (1) designated Threatened species, Eastern Meadowlark, was confirmed on site during the field investigations and nesting habitat was identified.
- Eight (8) designated species of Special Concern were confirmed on site during the field investigations.
- Candidate SWH for bat maternity colonies may be present within the forested communities of the Study Area. A preliminary search for potential bat cavity trees was completed from the MTO ROW during the 2022 field investigations. 16 low or moderate ranked bat cavity trees (based on preliminary assessment) were identified within the Study Area.

Based on the Preliminary Design, potential impacts to vegetation, SAR/SAR habitat and SWH are anticipated to include permanent impacts to forest, open agriculture, and meadow communities due to vegetation removals (including tree and shrub) for the modifications of the Highway 401 and Power Dam Drive interchange.

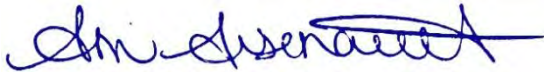
Further species-specific surveys are required during the detail design phase of this project to confirm the presence of SAR/ SAR habitat or SWH within the Study Area, including completing detailed bat cavity surveys and acoustic monitoring within the forested communities, completing Pileated Woodpecker nesting cavity searches where construction is proposed prior to project works (to identify the potential need to register the activity under the ESA and MBCA), and to survey forested habitats situated on private properties for SAR vegetation (i.e., Butternut or Black Ash).

9. CLOSURE

We trust the information presented in this report meets your requirements. If you have any further questions or need additional details, please do not hesitate to contact our office.

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10. REFERENCES

- Audubon. 2023. Guide to North American Birds. Accessed online from <https://www.audubon.org/bird-guide>
- Banton, E., Mico, M., Racey, G. 2009. Ecosites of Ontario Draft, Boreal Factsheets. Ontario Ministry of Natural Resources. Sault Ste. Marie, ON.
- City of Ottawa. 2003. City of Ottawa Official Plan. <https://ottawa.ca/en/planning-development-and-construction/official-plan-and-master-plans/official-plan#volume-1-official-plan>
- Colin Jones, Ross Layberry, and Alan Macnaughton. 2019. Ontario Butterfly Atlas Online. Toronto Entomologists' Association. http://www.ontarioinsects.org/atlas_online.htm
- COSEWIC. 2022. Committee on the Status of Endangered Wildlife in Canada. <https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html>
- COSEWIC. 2018. COSEWIC assessment and status report on the Midland Painted Turtle (*Chrysemys picta*) marginata and the Eastern Painted Turtle *Chrysemys picta picta* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xvi + 107 pp. (<http://www.registrelepsararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1>).
- COSEWIC. 2016a. COSEWIC assessment and status report on the Blanding's Turtle (*Emydoidea blandingii*), Nova Scotia population and Great Lakes/St. Lawrence population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xix + 110 pp. (<http://www.registrelepsararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1>).
- COSEWIC. 2016b. COSEWIC assessment and status report on the Evening Grosbeak *Coccothraustes vespertinus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 64 pp. (<http://www.registrelepsararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1>).
- COSEWIC. 2014. COSEWIC assessment and status report on the Eastern Milksnake *Lampropeltis triangulum* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 61 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- COSEWIC. 2013a. COSEWIC assessment and status report on the Bank Swallow (*Riparia riparia*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 48 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- COSEWIC. 2013b. COSEWIC assessment and status report on the Grasshopper Sparrow pratensis subspecies *Ammodramus savannarum pratensis* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 36 pp. (www.registrelepsararegistry.gc.ca/default_e.cfm).
- COSEWIC. 2013c. COSEWIC assessment and status report on the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis*

- subflavus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- COSEWIC. 2012a. COSEWIC assessment and status report on the Eastern Musk Turtle *Sternotherus odoratus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 68 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- COSEWIC. 2012b. COSEWIC assessment and status report on the Eastern Wood-pewee (*Contopus virens*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- COSEWIC. 2012c. COSEWIC assessment and status report on the Wood Thrush (*Hylocichla mustelina*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 46 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).
- COSEWIC. 2011a. COSEWIC assessment and status report on the Barn Swallow (*Hirundo rustica*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. ix + 37 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2011b. COSEWIC assessment and status report on the Eastern Meadowlark (*Sturnella magna*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2010a. COSEWIC assessment and status report on the Bobolink (*Dolichonyx oryzivorus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 42 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2010b. COSEWIC assessment and status report on the Monarch (*Danaus plexippus*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 43 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2009. COSEWIC assessment and status report on the Whip-poor-will *Caprimulgus vociferus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 28 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2008a. COSEWIC assessment and status report on the Snapping Turtle *Chelydra serpentina* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2008b. COSEWIC assessment and update status report on the Western Chorus Frog *Pseudacris triseriata* Carolinian population and Great Lakes/St. Lawrence – Canadian Shield population in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 47 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- COSEWIC. 2007. COSEWIC assessment and status report on the Common Nighthawk (*Chordeiles minor*) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 25 pp. (www.sararegistry.gc.ca/status/status_e.cfm).
- Crins, W.J., Gray P.A., Uhlig, P., and Wester, M. 2009. The Ecosystems of Ontario, Part 1: Ecozones and Ecoregions. Queen's Printer for Ontario.

- Dobbyn, J.S. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists, Don Mills, Ontario, 120 pp.
- eBird. 2022. eBird: An online database of bird distribution and abundance. eBird, Cornell Lab of Ornithology, Ithaca, New York. Accessed at: <http://www.ebird.org>.
- Environment Canada. 2021. General Nesting Periods of Migratory Birds in Canada. Retrieved from Environment Canada: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1#_05.
- Lee, H. 2008. Southern Ontario Ecological Land Classification: Vegetation Type List. Ontario Ministry of Natural Resources. London, Ontario.
- Ministry of Natural Resources and Forestry. 2022a. Make a Natural Heritage Map <https://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map>.
- Ministry of Natural Resources and Forestry. 2022b. Phragmites fact sheet. Accessed online from <https://www.ontario.ca/page/phragmites-fact-sheet>
- Ministry of Natural Resources and Forestry. 2021. Wild Parsnip. Accessed online from <https://www.ontario.ca/page/wild-parsnip>
- Ministry of Natural Resources and Forestry. 2015. Natural Heritage Reference Manual.
- Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. <https://www.ontario.ca/document/significant-wildlife-habitat-ecoregional-criteria-schedules-ecoregion-6e>
- Ministry of Natural Resources and Forestry. 2014. Management Plan for the Bald Eagle (*Haliaeetus leucocephalus*) in Ontario. Ontario Management Plan Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario by Armstrong, Ted (E.R.). vii + 53 pp.
- Ministry of Natural Resources and Forestry. 2000. Significant Wildlife Habitat Technical Guide.
- Ministry of Transportation Ontario. 2013. Environmental Reference for Highway Design.
- Ministry of Transportation Ontario. 2000. Class Environmental Assessment for Provincial Transportation Facilities.
- Ministry of the Environment, Conservation and Parks. 2021. Eastern Meadowlark General Habitat Description.
- Muncaster Environmental Planning Inc. 2017. Environmental Impact Statement for Proposed Research and Development Facility on Moodie Drive. Accessed online from: <https://img1.wsimg.com/blobby/go/9ec0cca8-76cd-4fd9-9759-0053dc7ee628/downloads/R-%20Environmental%20Impact%20Satement%20-%20D02-02-17-0.PDF?ver=1659631601794>
- Naughton, D. 2012. The Natural History of Canadian Mammals, Second edition. University of Toronto Press, Scholarly Publishing Division. <https://dr6j45jk9xcmk.cloudfront.net/documents/4716/mnrf-sar-rs-rvrne-clbtl-en.pdf>

Ontario Nature. 2022. Ontario Reptile and Amphibian Atlas: Range Maps. Ontario Nature, Ontario. <https://ontarionature.org/oraa/maps/>

Ontario Breeding Bird Atlas. 2022. www.birdsontario.org/atlas/atlasmain.html

APPENDIX A - Background Data Summary

**APPENDIX A: BACKGROUND DATA COLLECTION FOR SPECIES WITHIN THE VICINITY
OF THE HIGHWAY 401 AT POWER DAM DRIVE PROJECT AREA**

Online Data Source	Square ID#	Species Common Name	Latest Year of Observation
Natural Heritage Information Centre (NHIC)	18WQ1389	Eastern Meadowlark	-
		Least Bittern	-
	18WQ1489	Eastern Meadowlark	-
		Common Gallinule (S3B)	
	18WQ1490	Eastern Meadowlark	-
	18WQ1588	Bobolink	-
		Eastern Meadowlark	-
	18WQ1589	Eastern Meadowlark	-
Ontario Butterfly Atlas (OBA)	18WQ18	American Lady	2019
		Baltimore Checkerspot	2016
		Banded Hairstreak	2021
		Black Swallowtail	2021
		Cabbage White	2021
		Canadian Tiger Swallowtail	2021
		Clouded Sulphur	2021
		Common Buckeye	2012
		Common Ringlet	2021
		Common Wood-Nymph	2021
		Compton Tortoiseshell	2021
		Delaware Skipper	2021
		Dreamy Duskywing	2021
		Dun Skipper	2021
		Eastern Comma	2021
		Eastern Giant Swallowtail	2021
		Eastern Pine Elfin	2015
		Eastern Tailed Blue	2021
		European Common Blue	2021
		European Skipper	2020
		Eyed Brown	2019
		Gray Comma	2018
		Great Spangled Fritillary	2021
		Hickory Hairstreak	2021
		Hobomok Skipper	2020
		Juvenal's Duskywing	2019
		Least Skipper	2020
		Leonard's Skipper	2020
		Little Wood-Satyr	2021
		Long Dash Skipper	2020
		Meadow Fritillary	2020

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Online Data Source	Square ID#	Species Common Name	Latest Year of Observation
		Midsummer Tiger Swallowtail	2018
		Milbert's Tortoiseshell	2019
		Monarch	2021
		Mourning Cloak	2021
		Mustard White	2019
		Northern Azure	2021
		Northern Cloudywing	2020
		Northern Crescent	2021
		Northern Pearly-Eye	2020
		Orange Sulphur	2021
		Painted Lady	2019
		Pearl Crescent	2020
		Peck's Skipper	2019
		Question Mark	2019
		Red Admiral	2021
		Silver-spotted Skipper	2021
		Silvery Blue	2020
		Striped Hairstreak	2016
		Tawny-edged Skipper	2021
		Tiger Swallowtail complex	2020
		Viceroy	2021
		White Admiral	2020
	18WQ19	Arctic Skipper	2016
		Banded Hairstreak	2016
		Black Swallowtail	2018
		Cabbage White	2021
		Canadian Tiger Swallowtail	2016
		Clouded Sulphur	2021
		Common Ringlet	2021
		Common Wood-Nymph	2018
		Dreamy Duskywing	2018
		Dun Skipper	2016
		Eastern Comma	2021
		Eastern Giant Swallowtail	2021
		Eastern Tailed Blue	2021
		European Skipper	2019
		Great Spangled Fritillary	2021
		Hobomok Skipper	2016
		Juvenal's Duskywing	2019
		Least Skipper	2016
		Little Wood-Satyr	2016

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Online Data Source	Square ID#	Species Common Name	Latest Year of Observation
		Midsummer Tiger Swallowtail	2019
		Milbert's Tortoiseshell	2021
		Monarch	2021
		Mustard White	2020
		Northern Azure	2021
		Northern Crescent	2021
		Northern Mourning Cloak	2021
		Northern Pearly-Eye	2019
		Orange Sulphur	2021
		Painted Lady	2019
		Pearl Crescent	2018
		Peck's Skipper	2019
		Red Admiral	2019
		Silver-spotted Skipper	2019
		Silvery Blue	2020
		Viceroy	2019
		White Admiral	2018
Ontario Reptile and Amphibian Atlas (ORAA)	18WQ18	American Bullfrog	2008
		American Toad	2018
		Blanding's Turtle	2011
		Eastern Gartersnake	2018
		Eastern Musk Turtle	2011
		Gray Treefrog	2008
		Green Frog	2018
		Midland Painted Turtle	2019
		Northern Leopard Frog	2018
		Northern Map Turtle	2016
		Snapping Turtle	2019
		Spring Peeper	2019
		Wood Frog	2001
	18WQ19	American Bullfrog	
		American Toad	
		Blue-spotted Salamander	
		Gray Treefrog	
		Green Frog	
		Midland Painted Turtle	
		Northern Leopard Frog	
		Spring Peeper	
		Wood Frog	
	18TWQ18	American Crow	2001-2005
		American Goldfinch	

**APPENDIX A: BACKGROUND DATA COLLECTION FOR SPECIES WITHIN THE VICINITY
OF THE HIGHWAY 401 AT POWER DAM DRIVE PROJECT AREA**

Online Data Source	Square ID#	Species Common Name	Latest Year of Observation
Ontario Breeding Bird Atlas (OBBA)		American Redstart	
		American Robin	
		Baltimore Oriole	
		Barn Swallow	
		Black-capped Chickadee	
		Blue Jay	
		Bobolink	
		Canada Goose	
		Cedar Waxwing	
		Chipping Sparrow	
		Cliff Swallow	
		Common Grackle	
		Common Raven	
		Common Tern	
		Common Yellowthroat	
		Double-crested Cormorant	
		Downy Woodpecker	
		Eastern Kingbird	
		Eastern Meadowlark	
		Eastern Phoebe	
		Eastern Wood-Pewee	
		European Starling	
		Gray Catbird	
		Great Crested Flycatcher	
		House Finch	
		House Sparrow	
		House Wren	
		Killdeer	
		Mallard	
		Marsh Wren	
		Mourning Dove	
		Northern Cardinal	
		Red-eyed Vireo	
		Red-winged Blackbird	
		Rock Pigeon (Feral Pigeon)	
		Ruby-throated Hummingbird	
		Savannah Sparrow	
		Song Sparrow	
		Swamp Sparrow	
		Tree Swallow	
		Turkey Vulture	

**APPENDIX A: BACKGROUND DATA COLLECTION FOR SPECIES WITHIN THE VICINITY
OF THE HIGHWAY 401 AT POWER DAM DRIVE PROJECT AREA**

Online Data Source	Square ID#	Species Common Name	Latest Year of Observation
		Veery	
		Warbling Vireo	
		White-breasted Nuthatch	
		Wild Turkey	
		Wood Thrush	
		Yellow Warbler	
		Yellow-bellied Sapsucker	
	18TWQ19	American Crow	
		American Goldfinch	
		American Robin	
		Baltimore Oriole	
		Barn Swallow	
		Black-capped Chickadee	
		Blue Jay	
		Bobolink	
		Brown-headed Cowbird	
		Canada Goose	
		Cedar Waxwing	
		Chipping Sparrow	
		Common Grackle	
		Common Yellowthroat	
		Eastern Kingbird	
		European Starling	
		Gray Catbird	
		Hairy Woodpecker	
		House Sparrow	
		House Wren	
		Indigo Bunting	
		Mallard	
		Mourning Dove	
		Northern Flicker	
		Northern Harrier	
		Red-winged Blackbird	
		Rock Pigeon	
		Savannah Sparrow	
		Song Sparrow	
		Turkey Vulture	
		White-breasted Nuthatch	
		Wild Turkey	
		Yellow-bellied Sapsucker	

APPENDIX B - Agency Correspondence

Ami Arsenault

From: Ami Arsenault
Sent: Tuesday, April 19, 2022 1:07 PM
To: info@rrca.on.ca
Cc: Dave Wood; Chantal Robillard
Subject: MTO - Power Dam Road - Information Request
Attachments: Assignment #4 - Project Location Map.kmz; Assignment #4 - Project Location.jpg

To whom it concerns,

Morrison Hershfield Limited (MH) has been retained by the Ontario Ministry of Transportation (MTO) Eastern Region to prepare the Preliminary Design and complete a Class Environmental Assessment (EA) Study for the conceptual design of a bridge which carries Power Dam Drive over Highway 401 including interchange modifications, falling within the jurisdiction of the Raisin River Conservation Authority (RRCA) – please refer to attached location maps. This project will include fisheries and terrestrial field investigations regarding surrounding natural areas that may be impacted by the proposed project. As such, we would like to request any fish community/fish habitat, terrestrial and/or Species at Risk information that RVCA has available for the project location to assist MH in the documentation of natural environment existing conditions and potential constraints to the project.

Should you have any questions or comments regarding this request, please feel free to contact me directly.

Thank you,

Ami

Ami Arsenault, Dipl., ISA Certified Arborist

Ecology Team, Intermediate Terrestrial Biologist

aarsenault@morrisonhershfield.com

Tel: 613-739-2910 x1022250 | Cell: 343-574-8711



200-2932 Baseline Road | Ottawa, ON K2H 1B1 Canada
morrisonhershfield.com

Ami Arsenault

From: Phil Barnes <phil.barnes@rrca.on.ca>
Sent: Monday, June 20, 2022 3:44 PM
To: Ami Arsenault; RRCA Reception
Cc: Dave Wood; Chantal Robillard
Subject: RE: MTO - Power Dam Road - Information Request
Attachments: PowerDamOnRampHazards.pdf; PowerDamOnRampHeritage.pdf

Good afternoon,

At this location, we do not have any additional information that can not be located from various online data sources. I have prepared two maps, one that shows the natural heritage features (wetlands, woodlands, ANSI, and possible species at risk), and a map that shows the natural hazards (or lack of mapped natural hazard features).

There are two watercourses near the site, the one to the South has no known classification, and the one to the east is listed as Class E.

I can confirm there are no Source Water Protection Intake Protection Zones or Wellhead Protection Areas on site or adjacent to the site.

Sincerely,
Phil Barnes

Phil Barnes, P.Eng.
Team Lead, Watershed Management
Raisin Region Conservation Authority
613-938-3611 x 240 www.rrca.on.ca

From: Ami Arsenault <AArsenault@morrisonhershfield.com>
Sent: June 15, 2022 5:51 PM
To: RRCA Reception <info@rrca.on.ca>
Cc: Dave Wood <DWood@morrisonhershfield.com>; Chantal Robillard <CRobillard@morrisonhershfield.com>; Phil Barnes <phil.barnes@rrca.on.ca>
Subject: RE: MTO - Power Dam Road - Information Request

Good afternoon Phil,

I am following up on the information request below regarding the modifications of the bridge/overpass at the intersection of Highway 401 and Power Dam Road (i.e., Assignment 4) that was originally submitted on **April 19, 2022** (see email below). I have reattached the documents that were included with the initial info request email.

If you can kindly provide an update on the status of the information request that would be greatly appreciated.

Should you have any questions, don't hesitate to contact me directly.

Regards,

Ami

From: RRCA Reception <info@rrca.on.ca>

Sent: Tuesday, April 19, 2022 5:32 PM

To: Ami Arsenault <AArsenault@morrisonhershfield.com>

Cc: Dave Wood <DWood@morrisonhershfield.com>; Chantal Robillard <CRobillard@morrisonhershfield.com>; Phil Barnes <phil.barnes@rrca.on.ca>

Subject: FW: MTO - Power Dam Road - Information Request

Good afternoon Ami,

Thank you for contacting us. I am forwarding your request to Phil Barnes, RRCA Watershed Management Team Lead (cc'd).

Regards,

Vincent Pilon

Public Information Coordinator

Raisin Region Conservation Authority

613-938-3611 | www.rrca.on.ca

From: Ami Arsenault <AArsenault@morrisonhershfield.com>

Sent: April 19, 2022 1:07 PM

To: RRCA Reception <info@rrca.on.ca>

Cc: Dave Wood <DWood@morrisonhershfield.com>; Chantal Robillard <CRobillard@morrisonhershfield.com>

Subject: MTO - Power Dam Road - Information Request

To whom it concerns,

Morrison Hershfield Limited (MH) has been retained by the Ontario Ministry of Transportation (MTO) Eastern Region to prepare the Preliminary Design and complete a Class Environmental Assessment (EA) Study for the conceptual design of a bridge which carries Power Dam Drive over Highway 401 including interchange modifications, falling within the jurisdiction of the Raisin River Conservation Authority (RRCA) – please refer to attached location maps. This project will include fisheries and terrestrial field investigations regarding surrounding natural areas that may be impacted by the proposed project. As such, we would like to request any fish community/fish habitat, terrestrial and/or Species at Risk information that RRCA has available for the project location to assist MH in the documentation of natural environment existing conditions and potential constraints to the project.

Should you have any questions or comments regarding this request, please feel free to contact me directly.

Thank you,

Ami

Ami Arsenault, Dipl., ISA Certified Arborist

Ecology Team, Intermediate Terrestrial Biologist

aarsenault@morrisonhershfield.com

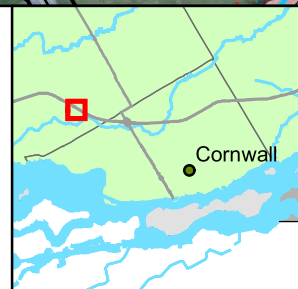
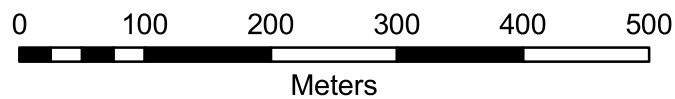
Tel: 613-739-2910 x1022250 | Cell: 343-574-8711



Map 2: Natural Hazards



- Selected Parcel
- Organics - Muck Soil
- Watercourse
- 15m Water Setback
- Floodplain
- Floodplain 15m Setback

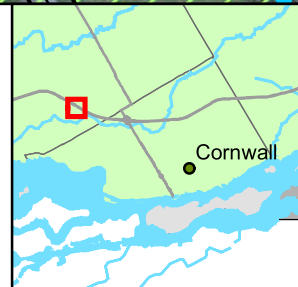
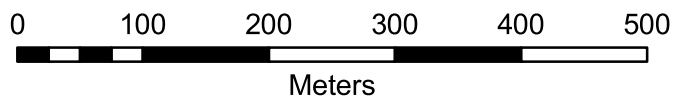


Raisin Region
Conservation Authority

Map 3: Natural Heritage



- | | |
|-----------------|------------------------|
| Selected Parcel | Wetlands |
| Watercourse | Evaluated-Provincial |
| ANSI | Evaluated-Other |
| NHIC Data | Not evaluated per OWES |
| | Significant Woodlands |



Raisin Region
Conservation Authority

Ministry of Transportation
NDMNRF Information Request

December 16, 2021

Ministry of Northern Development, Mines, Natural Resources and Forestry
Unit 1, 10 Campus Drive,
Kemptville, ON K0G 1J0

Re: Data Request for Fisheries and Natural Heritage Information – Kemptville District, Ontario

Attention: Kemptville District (NDMNRF)

In accordance with the *MTO/DFO/NDMNRF Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings - Version 4, 2020* (the Protocol), this letter is to request background data for Fisheries, and Significant Natural Heritage Features from the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) for the following Ministry of Transportation (MTO) undertaking of:

- **Agreement #4019-E-0023: Assignment #4** – Proposed work associated with this MTO Assignment includes the Detail Design for the Replacement of an overpass bridge (Site 13-180) that carries Power Dam Drive over Highway 401 in the Municipality of South Stormont. The scope of the assignment includes fisheries, terrestrial, and SAR field investigations to support the proposed works.

Morrison Hershfield Limited (MH) has been retained by the MTO to conduct spring and summer field investigations under the Protocol for this project. MH fisheries biologists have reviewed existing online background information that was made available through desktop aquatic resource data (i.e., Fish ON-line and Land Information Ontario LIO) and the results are provided in **bold italics** within the attached **Table 1**. One defined watercourse, South Raisin River, was identified within the immediate vicinity of the project area. Additionally, three unnamed tributaries of South Raisin River are conveyed beneath Highway 401 within the project limits. We request that the NDMNRF reviews **Table 1** in order to confirm and update the information regarding aquatic features identified within the study area as well as any other aquatic values located within the project limits.

MH would also like to request any available terrestrial and/or natural heritage feature(s) data for the project location at Highway 401 and Power Dam Drive, as well as the adjacent lands which have the potential to be impacted by the proposed undertaking such as Provincially Significant Wetlands (PSW's), Significant Woodlots, wildlife concentration areas, etc. MH terrestrial biologists have reviewed background information pertaining to terrestrial values surrounding the study area through accessing online resources including LIO, and Natural Heritage Information Centre (NHIC). The results of this desktop review are provided in **bold italics** within the attached **Table 2**. We request that the NDMNRF reviews **Table 2** in order to confirm and update the information regarding non-SAR terrestrial species/habitat present as well as any other significant natural heritage features (i.e., PSW's) within the study area.

We look forward to a response from NDMNRF within **30 working days**, as specified in the Protocol.

Thank you,



Dave Wood
Fisheries Biologist
DWood@morrisonhershfield.com

Table 1: Fish and fish habitat information for the intersection of Highway 401 and Power Dam Drive

Location of Work (GPS coordinates & Google Earth map)	Watercourse classification (i.e. warmwater, coldwater)	Habitat information/ locations (fish passage barriers, known spawning habitats, groundwater upwellings, migratory corridors etc.)	Historical data on fish species present, including whether the subject waterbody(s) [SPECIFY LOCATION] are considered to support any vulnerable, threatened or endangered aquatic species	NDMNRF fisheries management objectives, if applicable	In-water timing windows for construction
South Raisin River approximately 600 m southeast of Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N) See <i>project location map</i>	Warm	Unknown	<u>LIO ARA Layer:</u> Banded Killifish, Blacknose Shiner, Bluntnose Minnow, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fantail Darter, Fathead Minnow, Golden Shiner, Iowa Darter, Johnny Darter, Johnny Darter x Tesselated Darter, Largemouth Bass, Logperch, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, Round Goby, Spotfin Shiner, Sunfishes, Tadpole Madtom, White Sucker, Yellow Perch <u>Fish ON-Line:</u> Brown Bullhead, Common Carp, Largemouth Bass, Northern Pike, Pumpkinseed, Rock Bass,	Unknown	July 1 - Dec 31

Ministry of Transportation
NDMNRF Information Request

			<i>White Sucker, Yellow Perch, Walleye, Burbot</i> <u>NHIC:</u> No Data <u>DFO SAR Map:</u> No Data		
Unnamed tributary (1) of South Raisin River approximately 900 m northwest of Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N) See <i>project location map</i>	Unknown	Warm	<u>LIO ARA Layer:</u> Brook Stickleback, Creek Chub, Northern Redbelly Dace <u>NHIC:</u> No Data <u>DFO SAR Map:</u> No Data	Unknown	March 15 – June 30
Unnamed tributary (2) of South Raisin River approximately 1 km southeast of Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N) See <i>project location map</i>	Unknown	Warm	Unknown	Unknown	March 15 – June 30
Unnamed tributary (3) of South Raisin River approximately 90 m west of Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N)	Unknown	Warm	Unknown	Unknown	March 15 – June 30

Ministry of Transportation
NDMNRF Information Request

See <i>project location map</i>					
Row for updated information from NDMNRF					

Table 2: Terrestrial data available from online resources for the intersection of Highway 401 and Power Dam Drive.

Location of Work (GPS coordinates & Google Earth map)	Land Information Ontario (LIO)	Natural Heritage Information Centre (NHIC).
Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N) including surrounding lands (see project location map).	No information available	No information available
Row for updated information from NDMNRF		

NOTE:

- NDMNRF is required as per Step 2 of the Fisheries Protocol to provide the applicant with the information outlined in the above table within **30 working days**.

Ami Arsenault

From: Andrew Ritchie
Sent: Wednesday, March 2, 2022 8:38 AM
To: Baczyk, Steve (MTO); Anabtawi, Abdallah (MTO)
Cc: Brad Hewton; Zach Hupman; Dylan McEvoy; Brian Dawod; Ami Arsenault; Tom Howson; Dave Wood
Subject: RE: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Good day Steve,

Thanks for the information, much appreciated. I have copied our Terrestrial/Aquatic Specialists who will review and confirm that all is in order.

Thanks again for your efforts and have a great day.

Andrew

Andrew Ritchie, M.Pl., MCIP, RPP
Senior Environmental Planner
aritchie@morrisonhershfield.com



Suite 175, 1005 Skyview Drive | Burlington, ON L7P 5B1
Dir: 289 266 1918 | Toll Free: 1 (888) 649-4730 | Fax: 905 319 5548
morrisonhershfield.com

From: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>
Sent: February 28, 2022 12:39 PM
To: Andrew Ritchie <ARitchie@morrisonhershfield.com>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>
Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>
Subject: RE: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Hi Andrew,

Sorry for the delayed response, but I needed to consult with the Policy office and other planners to ensure that we, Environmental Planners, are able to provide SAR data, and what we provide is consistent with the ministry approach across the province.

Based on those discussions, I have reviewed the NHIC list that was provided below by MH and my review confirmed the presence of species that MH has identified. The additional species that I noted are provided below within the table. Unfortunately, I cannot confirm the presence of any species provided below based on the information from the Bird, Reptile/Amphibian or Butterfly atlases as we don't have access to those databases.

Please note, we have been advised that any sensitive or restricted data should only be provided if there is a specific request for it and there is a clear, defined need so it would not be provided at this time.

<u>Project Location</u>	<u>Aquatic SAR Information</u>	<u>Terrestrial SAR Information</u>
Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N)	No Aquatic SAR Identified	Natural Heritage Information Centre – (Data Squares 18WQ1388, 18WQ1389, 18WQ1490, 18WQ1489, 18WQ1588, 18WQ1589): Bobolink, Wood Thrush, Eastern Meadowlark Ontario Breeding Bird Atlas (Data Square 18TWQ18): Barn Swallow, Bobolink, Eastern Meadowlark, Eastern Wood Pewee, Wood Thrush Ontario Reptile & Amphibian Atlas (Data Square 18WQ18): Blanding’s Turtle, Eastern Musk Turtle, Midland Painted Turtle, Northern Map Turtle, Snapping Turtle Ontario Butterfly Atlas (Data Square 18WQ18): Monarch
MTO SAR Data Update	ADDITIONAL SPECIES: Cutlip Minnow	NHIC Data Squares: 18WQ1388, 18WQ1389, 18WQ1490, 18WQ1489, 18WQ1588, 18WQ1589: Bobolink – <i>confirmed</i> Wood Thrush – <i>confirmed</i> Eastern Meadowlark – <i>confirmed</i> ADDITIONAL SPECIES: - Snapping Turtle - Least Bittern

If you have any questions about this information or wish to discuss it further please let me know. Again, my apologies for the delay!

Thanks,
Steve

Steve Baczyk | Environmental Planner
Ministry of Transportation | Environmental Delivery East
1355 John Counter Boulevard | Kingston | Ontario | K7L 5A3
☎ Cell 613-539-5280 | ✉ steve.baczyk@ontario.ca

From: Andrew Ritchie <ARitchie@morrisonhershfield.com>

Sent: February 10, 2022 2:13 PM

To: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>

Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>

Subject: Re: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request
Importance: High

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good day Steve,

Understood and appreciated. Please keep us apprised as things progress.

Best regards,

Andrew

Andrew Ritchie, M.P.I., MCIP, RPP

Senior Environmental Planner

aritchie@morrisonhershfield.com



Suite 175, 1005 Skyview Drive | Burlington, ON L7P 5B1

Dir: 289 266 1918 | Toll Free: 1 (888) 649-4730 | Fax: 905 319 5548

morrisonhershfield.com

From: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>

Sent: February 9, 2022 12:31 PM

To: Andrew Ritchie <ARitchie@morrisonhershfield.com>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>

Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>

Subject: RE: Re: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Hi Andrew,

Sorry for a delayed response, but I am working through the MTO application process to obtain access to the MNRF restricted SAR database. I am hoping to get this access very soon and will reply to your request as soon as I can.

Thanks,

Steve

Steve Baczyk | Environmental Planner

Ministry of Transportation | Environmental Delivery East

1355 John Counter Boulevard | Kingston | Ontario | K7L 5A3

☎ Cell 613-539-5280 | ✉ steve.baczyk@ontario.ca

From: Andrew Ritchie <ARitchie@morrisonhershfield.com>

Sent: February 8, 2022 3:16 PM

To: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>

Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>

Subject: RE: Re: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Importance: High

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good day Steve,

Hopefully this email finds you and yours well. I am following up on my email below.

Could you please advise of the status of our request for terrestrial/aquatic SAR and SAR habitat occurrence data from MTO. We are looking to compile all available secondary data to prepare our initial Exiting Conditions reports to complete the evaluation of alternatives.

Thanks, and much appreciated.

Andrew

Andrew Ritchie, M.P.I., MCIP, RPP

Senior Environmental Planner

aritchie@morrisonhershfield.com



Suite 175, 1005 Skyview Drive | Burlington, ON L7P 5B1

Dir: 289 266 1918 | Toll Free: 1 (888) 649-4730 | Fax: 905 319 5548

morrisonhershfield.com

From: Andrew Ritchie

Sent: January 14, 2022 4:13 PM

To: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>

Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>

Subject: Re: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Importance: High

Good day Steve,

A belated Happy New Year to you and yours. It is our understanding that the Ministry of Transportation (MTO) is now able to access the provincial Species at Risk (SAR) database for species/habitat protected under the *Endangered Species Act* (ESA). Morrison Hershfield (MH) would like to request terrestrial/aquatic SAR and SAR habitat occurrence data from MTO for the following project:

- **Agreement #4019-E-0023: Assignment #4** – Proposed work associated with this MTO Assignment includes Preliminary Design for the replacement of an overpass bridge (Site 13-180) that carries Power Dam Drive over Highway 401 in the Municipality of South Stormont. The scope of the assignment includes fisheries, terrestrial, and SAR field investigations to support the proposed works.

Please refer to the attached map and KMZ file which outline the project location along Highway 401. Information regarding SAR within the project area which was gathered by MH from online resources has been compiled within the table below. We request that MTO confirms and/or updates this information as necessary.

<u>Project Location</u>	<u>Aquatic SAR Information</u>	<u>Terrestrial SAR Information</u>
Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N)	No Aquatic SAR Identified	Natural Heritage Information Centre – (Data Squares 18WQ1388, 18WQ1389, 18WQ1490, 18WQ1489, 18WQ1588, 18WQ1589): Bobolink, Wood Thrush, Eastern Meadowlark

		Ontario Breeding Bird Atlas (Data Square 18TWQ18): Barn Swallow, Bobolink, Eastern Meadowlark, Eastern Wood Pewee, Wood Thrush Ontario Reptile & Amphibian Atlas (Data Square 18WQ18): Blanding's Turtle, Eastern Musk Turtle, Midland Painted Turtle, Northern Map Turtle, Snapping Turtle Ontario Butterfly Atlas (Data Square 18WQ18): Monarch
MTO SAR Data Update		

Please note that our Team has also submitted a similar request to the NDMNRF Kemptville District Office. Please acknowledge receipt and let us know if you have any questions about this request.

Thanks for your efforts, and best regards,

Andrew

Andrew Ritchie, M.Pl., MCIP, RPP

Senior Environmental Planner

aritchie@morrisonhershfield.com



Suite 175, 1005 Skyview Drive | Burlington, ON L7P 5B1

Dir: 289 266 1918 | Toll Free: 1 (888) 649-4730 | Fax: 905 319 5548

morrisonhershfield.com

APPENDIX C - Photographic Record



Photo 1. 1 cm DBH Butternut identified within the FOM community immediately adjacent to OAG. April 21, 2022.



Photo 2. Overview of dry-fresh mixed meadow (MEMM3) communities bordering the Highway 401 ROW. April 21, 2022.



Photo 3. Overview of deciduous forest (FODM6) community adjacent to residential homes on Power Dam Drive. April, 2022.



Photo 4. Example of candidate bat cavity tree (see woodpecker holes) within FODM6 community. April 21, 2022.



Photo 5. Eastern Garter Snake identified within the MEMM3 community adjacent to the Power Dam Drive footing. April 21, 2022.



Photo 6. Facing south from where Eastern Garter Snake was identified. April 21, 2022.



Photo 7. Overview of forested FODM4 community north of Highway 401, east of Power Dam Drive. April 21, 2022.



Photo 8. Facing OAG and SAM1-1 community, facing east from Power Dam Drive. June 15, 2022.



Photo 9. OAG community south of Highway 401, east of Power Dam Drive. June 15, 2022.



Photo 10. Power Dam Drive overpass – no Barn Swallow nests. June 15, 2022.



Photo 11. European Starling nest within MEMM3 community in tree snag. June 15, 2022.



Photo 12. Cedar Waxwing observed during breeding bird survey 1. June 15, 2022.



Photo 13. OAG community south of Hwy 401 and east of Power Dam Drive. Eastern Meadowlark observed. June 15, 2022.



Photo 14. SAM1-1 community adjacent to ROW and OAG communities south of Highway 401. June 15, 2022.



Photo 15. Savannah Sparrow perched on hydro wire facing OAG community. June 15, 2022.



Photo 16. Overview of deciduous thicket community (THDM5) north of Highway 401. June 15, 2022

APPENDIX D - Study Area Wildlife Observations

APPENDIX D –PLANT LIST AND WILDLIFE OBSERVATIONS- HIGHWAY 401 AND POWER DAM DRIVE STUDY AREA

Table D1: Vascular Plant List

Common Name	Scientific Name	Coefficient Conservation	Coefficient Wetness	SRank	Introduced
Alsike Clover	<i>Trifolium hybridum ssp. elegans</i>	0	1	SE5	I
American Beech	<i>Fagus grandifolia</i>	6	3	S5	
American Mountain-ash	<i>Sorbus americana</i>	8	-1	S5	
Amur Maple	<i>Acer ginnala</i>	0	5	SE1	I
Aster Species	<i>Symphyotrichum sp</i>				
Awl-fruited Sedge	<i>Carex stipata</i>	3	-5	S5	
Basswood	<i>Tilia americana</i>	4	3	S5	
Bird's-foot Trefoil	<i>Lotus corniculatus</i>	0	1		I
Bittersweet Nightshade	<i>Solanum dulcamara</i>	0	0	SE5	I
Black Medick	<i>Medicago lupulina</i>	0	1	SE5	I
Bladder Campion	<i>Silene latifolia</i>	0	5	SE5	I
Broad-leaved Cattail	<i>Typha latifolia</i>	3	-5	S5	
Brown Knapweed	<i>Centaurea jacea</i>	0	5	SE5	I
Bull Thistle	<i>Cirsium vulgare</i>	0	4	SE5	I
Butternut	<i>Juglans cinerea</i>	6	2	S2	
Canada Anemone	<i>Anemone canadensis</i>	3	-3	S5	
Canada Thistle	<i>Cirsium arvense</i>	0	3	SE5	I
Common Buckthorn	<i>Rhamnus cathartica</i>	0	3	SE5	I
Common Burdock	<i>Arctium minus ssp. minus</i>	0	5	SE5	I
Common Dandelion	<i>Taraxacum officinale</i>	0	3	SE5	I
Common Evening-primrose	<i>Oenothera biennis</i>	0	3	S5	
Common Gromwell	<i>Lithospermum officinale</i>	0	5	SE5	I
Common Milkweed	<i>Asclepias syriaca</i>	0	5	S5	
Common Mugwort	<i>Artemisia vulgaris</i>	0	5	SE5	I
Common Mullein	<i>Verbascum thapsus</i>	0	5	SE5	I
Common Pepper-grass	<i>Lepidium densiflorum</i>	0	0	SE5	I
Common Plantain	<i>Plantago major</i>	0	-1	SE5	I
Common Ragweed	<i>Ambrosia artemisiifolia</i>	0	3	S5	
Common St. John's-wort	<i>Hypericum perforatum</i>	0	5	SE5	I

**APPENDIX D –PLANT LIST AND WILDLIFE OBSERVATIONS- HIGHWAY 401 AND POWER
DAM DRIVE STUDY AREA**

Common Name	Scientific Name	Coefficient Conservation	Coefficient Wetness	SRank	Introduced
Common Water-plantain	<i>Alisma plantago-aquatica</i>	3	-5	S5	
Common Yarrow	<i>Achillea millefolium ssp. millefolium</i>	0	3	SE	I
Cow Vetch	<i>Vicia cracca</i>	0	5	SE5	I
Curly Dock	<i>Rumex crispus</i>	0	-1	SE5	I
Cursed Crowfoot	<i>Ranunculus sceleratus var. sceleratus</i>	2	-5	S5	
Daisy Fleabane	<i>Erigeron annuus</i>	0	1	S5	
Dwarf Snapdragon	<i>Chaenorrhinum minus</i>	0	5	SE5	I
Elecampane	<i>Inula helenium</i>	0	5	SE5	I
False Solomon's Seal	<i>Maianthemum racemosum ssp. racemosum</i>	4	3	S5	
Field Bindweed	<i>Convolvulus arvensis</i>	0	5	SE5	I
Field Hawkweed	<i>Hieracium caespitosum ssp. caespitosum</i>	0	5	SE5	I
Field Horsetail	<i>Equisetum arvense</i>	0	0	S5	
Field Penny-cress	<i>Thlaspi arvense</i>	0	5	SE5	I
Flowering-rush	<i>Butomus umbellatus</i>	0	-5	SE5	I
Fly Honeysuckle	<i>Lonicera canadensis</i>	6	3	S5	
Fragrant Bedstraw	<i>Galium triflorum</i>	4	2	S5	
Goldenrod Species	<i>Solidago sp</i>				
Great Duckweed	<i>Spirodela polyrhiza</i>	4	-5	S5	
Hawthorn	<i>Crataegus conspecta</i>	4	5	S1	
Invasive Common Reed	<i>Phragmites australis ssp. australis</i>	0	-4	SE5	I
Lady's Thumb	<i>Polygonum persicaria</i>	0	-3	SE5	I
Large-leaved Aster	<i>Eurybia macrophylla</i>	5	5	S5	
Marsh Marigold	<i>Caltha palustris</i>	5	-5	S5	
Meadow Goat's-beard	<i>Tragopogon pratensis ssp. pratensis</i>	0	5	SE5	I
Narrow-leaved Cattail	<i>Typha angustifolia</i>	3	-5	S5	
Northern Arrowhead	<i>Sagittaria cuneata</i>	7	-5	S4?	
Northern Bedstraw	<i>Galium boreale</i>	7	0	S5	
Orchard Grass	<i>Dactylis glomerata</i>	0	3	SE5	I
Ox-eye Daisy	<i>Leucanthemum vulgare</i>	0	5	SE5	I

**APPENDIX D –PLANT LIST AND WILDLIFE OBSERVATIONS- HIGHWAY 401 AND POWER
DAM DRIVE STUDY AREA**

Common Name	Scientific Name	Coefficient Conservation	Coefficient Wetness	SRank	Introduced
Perennial Sow-thistle	<i>Sonchus arvensis ssp. uliginosus</i>	0	1	SE5	I
Philadelphia Fleabane	<i>Erigeron philadelphicus ssp. philadelphicus</i>	1	-3	S5	
Prickly Lettuce	<i>Lactuca serriola</i>	0	0	SE5	I
Prickly-ash	<i>Zanthoxylum americanum</i>	3	5	S5	
Quack Grass	<i>Elymus repens</i>	0	3	SE5	I
Red Ash	<i>Fraxinus pennsylvanica</i>	3	-3	S5	
Red Clover	<i>Trifolium pratense</i>	0	2	SE5	I
Red Maple	<i>Acer rubrum</i>	4	0	S5	
Red Pine	<i>Pinus resinosa</i>	8	3	S5	
Red-osier Dogwood	<i>Cornus stolonifera</i>	2	-3	S5	
Reed Canary Grass	<i>Phalaris arundinacea</i>	0	-4	S5	
Riverbank Grape	<i>Vitis riparia</i>	0	-2	S5	
Rose Twisted Stalk	<i>Streptopus roseus</i>	7	0	S5	
Rough-fruited Cinquefoil	<i>Potentilla recta</i>	0	5	SE5	I
Rush Species	<i>Juncus sp</i>				
Scarlet Pimpernel	<i>Anagallis arvensis</i>	0	4	SE4	I
Scouring Rush	<i>Equisetum hyemale ssp. affine</i>	2	-2	S5	
Sensitive Fern	<i>Onoclea sensibilis</i>	4	-3	S5	
Sharp-lobed Hepatica	<i>Anemone acutiloba</i>	6	5	S5	
Smooth Brome	<i>Bromus inermis ssp. inermis</i>	0	5	SE5	I
Spiny-leaved Sow-thistle	<i>Sonchus asper ssp. asper</i>	0	0	SE5	I
Spotted Touch-me-not	<i>Impatiens capensis</i>	4	-3	S5	
Squirrel-tail Grass	<i>Hordeum jubatum ssp. jubatum</i>	0	-1	SE5	I
Staghorn Sumac	<i>Rhus typhina</i>	1	5	S5	
Sugar Maple	<i>Acer saccharum ssp. saccharum</i>	4	3	S5	
Tall Buttercup	<i>Ranunculus acris</i>	0	-2	SE5	I
Tamarack	<i>Larix laricina</i>	7	-3	S5	
Tansy	<i>Tanacetum vulgare</i>	0	5	SE5	I

**APPENDIX D –PLANT LIST AND WILDLIFE OBSERVATIONS- HIGHWAY 401 AND POWER
DAM DRIVE STUDY AREA**

Common Name	Scientific Name	Coefficient Conservation	Coefficient Wetness	SRank	Introduced
Timothy	<i>Phleum pratense</i>	0	3	SE5	I
Trembling Aspen	<i>Populus tremuloides</i>	2	0	S5	
Virginia Creeper	<i>Parthenocissus quinquefolia</i>	6	1	S4?	
White Ash	<i>Fraxinus americana</i>	4	3	S5	
White Clover	<i>Trifolium repens</i>	0	2	SE5	I
White Elm	<i>Ulmus americana</i>	3	-2	S5	
White Sweet-clover	<i>Melilotus alba</i>	0	3	SE5	I
Wild Black Currant	<i>Ribes americanum</i>	4	-3	S5	
Wild Carrot	<i>Daucus carota</i>	0	5	SE5	I
Wild Parsnip	<i>Pastinaca sativa</i>	0	5	SE5	I
Wild Red Raspberry	<i>Rubus idaeus ssp. melanolasius</i>	0	-2	S5	
Wild Sarsaparilla	<i>Aralia nudicaulis</i>	4	3	S5	
Woodland Strawberry	<i>Fragaria vesca ssp. americana</i>	4	4	S5	
Wool Grass	<i>Scirpus cyperinus</i>	4	-5	S5	
Wormseed Mustard	<i>Erysimum cheiranthoides ssp. cheiranthoides</i>	0	3	SE5	I
Yellow Trout Lily	<i>Erythronium americanum ssp. americanum</i>	5	5	S5	
Zig-zag Goldenrod	<i>Solidago flexicaulis</i>	6	3	S5	

Table D2: Avian Observations

Common Name	Scientific Name	SARA Status	ESA Status
American Crow	<i>Corvus brachyrhynchos</i>	N/A	N/A
American Goldfinch	<i>Carduelis tristis</i>	N/A	N/A
American Kestrel	<i>Falco sparverius</i>	N/A	N/A
American Robin	<i>Turdus migratorius</i>	N/A	N/A
American Woodcock	<i>Scolopax minor</i>	N/A	N/A
Baltimore Oriole	<i>Icterus galbula</i>	N/A	N/A
Barn Swallow	<i>Hirundo rustica</i>	THR	THR
Black-capped Chickadee	<i>Poecile atricapillus</i>	N/A	N/A
Blue Jay	<i>Cyanocitta cristata</i>	N/A	N/A
Canada Goose	<i>Branta canadensis</i>	N/A	N/A

**APPENDIX D –PLANT LIST AND WILDLIFE OBSERVATIONS- HIGHWAY 401 AND POWER
DAM DRIVE STUDY AREA**

Common Name	Scientific Name	SARA Status	ESA Status
Cedar Waxwing	<i>Bombycilla cedrorum</i>	N/A	N/A
Chipping Sparrow	<i>Spizella passerine</i>	N/A	N/A
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	N/A	N/A
Common Grackle	<i>Quiscalus quiscula</i>	N/A	N/A
Common Raven	<i>Corvus corax</i>	N/A	N/A
Common Yellow-throat	<i>Geothlyphis trichas</i>	N/A	N/A
Downy Woodpecker	<i>Picoides pubescens</i>	N/A	N/A
Eastern Kingbird	<i>Tyrannus tyrannus</i>	N/A	N/A
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR
Eastern Phoebe	<i>Sayornis phoebe</i>	N/A	N/A
European Starling	<i>Sturnus vulgaris</i>	N/A	N/A
Gray Catbird	<i>Dumetella carolinensis</i>	N/A	N/A
Hairy Woodpecker	<i>Leuconotopicus villosus</i>	N/A	N/A
Killdeer	<i>Charadrius vociferus</i>	N/A	N/A
Merlin	<i>Falco columbarius</i>	N/A	N/A
Northern Cardinal	<i>Cardinalis cardinalis</i>	N/A	N/A
Northern Flicker	<i>Colaptes auratus</i>	N/A	N/A
Oven Bird	<i>Seiurus aurocapillus</i>	N/A	N/A
Red-eyed Vireo	<i>Vireo olivaceus</i>	N/A	N/A
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	N/A	N/A
Rock Pigeon	<i>Columba livia</i>	N/A	N/A
Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	N/A	N/A
Savannah Sparrow	<i>Passerculus sandwichensis</i>	N/A	N/A
Song Sparrow	<i>Melospiza melodia</i>	N/A	N/A
Turkey Vulture	<i>Cathartes aura</i>	N/A	N/A
White-breasted Nuthatch	<i>Sitta carolinensis</i>	N/A	N/A
Wild Turkey	<i>Meleagris gallopavo</i>	N/A	N/A
Yellow Warbler	<i>Dendroica petechia</i>	N/A	N/A
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	N/A	N/A

APPENDIX D –PLANT LIST AND WILDLIFE OBSERVATIONS- HIGHWAY 401 AND POWER DAM DRIVE STUDY AREA

Table D3: Mammalia Observations

Common Name	Scientific Name	SARA Status	ESA Status
Mouse sp.	<i>Muridae sp.</i>	N/A	N/A
Groundhog (burrows)	<i>Marmota monax</i>	N/A	N/A
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	N/A	N/A
White-tailed Deer (scat)	<i>Odocoileus virginianus</i>	N/A	N/A

Table D4: Herpetofauna Observations

Common Name	Scientific Name	SARA Status	ESA Status
Eastern Garter Snake	<i>Thamnophis sirtalis</i>	N/A	N/A

LEGEND

Coefficient of Conservation

This value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific habitat integrity

Coefficient of Wetness

5- Almost always occur on uplands

4, 3, 2- Usually occur on uplands

1, 0, -1- Found on uplands and in wetlands

-2, -3, -4- Usually occur in wetlands

-5- Almost always in wetlands

SRANK

SX – presumed Extirpated – not extinct, but no longer found in Ontario

S1 – Critically imperiled – extremely rare; often fewer than 5 occurrences

S2 – Imperiled – rare - very few populations, often 20 or fewer

S3 – Vulnerable – restricted range and/or few populations, 80 or less

S4 – Apparently Secure – uncommon but not rare

S5 – Secure – common, widespread, and abundant

COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

DD – Data Deficient

END – Endangered - A species facing imminent extirpation or extinction

EXP – Extirpated - A species no longer existing in the wild in Canada but occurring elsewhere.

APPENDIX D –PLANT LIST AND WILDLIFE OBSERVATIONS- HIGHWAY 401 AND POWER DAM DRIVE STUDY AREA

EXT – Extinct - A species that no longer exists.

NA – Non-active

NAR – Not At Risk - A species that has been evaluated and found to be not at risk of extinction given the current circumstances.

NS – No Status

SC – Special Concern (formerly vulnerable) - A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

THR – Threatened - A species likely to become endangered if limiting factors are not reversed.

ESA (Endangered Species Act, 2007)

DD – Data Deficient (formerly Indeterminate) - A species for which there is insufficient information for a provincial status recommendation.

END – Endangered - A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act (ESA)

EXP – Extirpated - A species that no longer exists in the wild in Ontario but still occurs elsewhere.

EXT – Extinct - A species that no longer exists anywhere.

NAR – Not at Risk - A species that has been evaluated and found to be not at risk.

SC – Special Concern (formerly Vulnerable) - A species with characteristics that make it sensitive to human activities or natural events.

THR – Threatened - A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

APPENDIX E - Species at Risk Likely to Occur in the Study Area

APPENDIX E: SPECIES AT RISK LIKELY TO OCCUR WITHIN THE POWER DAM DRIVE AND HIGHWAY 401 STUDY AREA

Species Grouping	Species Common Name	SARA Status	*ESA Status	Habitat Requirements	Associated ELC Communities	Suitable Habitat Present within Study Area	Species/Habitat Observed During Field Investigations
Avifauna	Barn Swallow (<i>Hirundo rustica</i>)	THR	THR	- Breeding and nesting occur in and on artificial structures, including barns and other outbuildings, bridges, and road culverts. - Prefer various types of open habitats for foraging, including grassy fields, pastures, various agricultural crops, lake, and river shorelines, cleared rights-of-way, farmyards, and wetlands.	TPO, CUM1, MAM, MAS, OAO, SAS2, SAM1, and SAF1 containing or adjacent to structures that are suitable for nesting.	High Probability	Yes. A general search for Barn Swallow nests was completed beneath the Power Dam Drive overpass during the time of field investigations, and none were identified; however, several Barn Swallow species were observed flying around the Shallow Aquatic community (SAM1) situated immediately adjacent to Agricultural Infrastructure (IAG) with shed and barn structures available for nesting opportunities. Visual searches for Barn Swallow nests on the man-made structures were completed from the publicly accessible ROW and were not observed during field investigations.
Herpetofauna	Blanding’s Turtle (<i>Emydoidea blandingii</i>)	THR	THR	- Blanding’s Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. - Blanding’s Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April - Females nest in a variety of substrates including sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops. - Adults and juveniles overwinter in a variety of water bodies that maintain pools averaging about 1 m in depth	SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present	Low Probability	No. The Shallow Aquatic (SAM1) communities present within the study area are small in size and isolated from other watercourse or wetland features that the Blanding’s Turtle would utilize throughout its life cycle. Blanding’s Turtle was not observed during the field investigations.
Plants	Butternut (<i>Juglans cinerea</i>)	END	END	- Butternut usually grows alone or in small groups in deciduous forests., preferring moist, well-drained soil and is often found along streams. - It is also found on well-drained gravel sites and rarely on dry, rocky soil. - This species does not do well in the shade, and often grows in sunny openings and near forest edges.	FOD and mature hedgerows	High Probability	Yes. One (1) Butternut individual was identified within the study area, located along the edge of the mixed forest community (FOM) immediately adjacent next to open pasture (OAG) and Highway 401 ROW. Butternut surveys were completed within the publicly accessible ROW’s and not within private property.
Avifauna	Bobolink (<i>Dolichonyx oryzivorus</i>)	THR	THR	- Foraging habitat is primarily found within agricultural crops measuring 5 ha to 30 ha in size. - Breeding habitat is also generally in hayfields and associated pastures due to plant cover at the start of the nesting season. - Row crops and pastures with high shrub densities are typically avoided.	OAG, CUM, and MAM2 with elevated song perches.	High Probability	No. Agricultural, meadow and pasture habitat communities are present within the study area that meet the size requirements for this species (between 5 ha and 30 ha). Bobolink were not observed during field investigations.
Avifauna	Eastern Meadowlark (<i>Sturnella magna</i>)	THR	THR	- Habitat is most common in native grasslands, pastures and savannas. Anthropogenic habitats are also used which includes hayfields, young orchards, golf courses, grassy roadsides, and herbaceous fencerows. - Breeding habitat is usually in large tracts of grasslands with a minimum area of 5 hectares.	TPO, TPS, CUM1, CUS, and MAM2 with elevated song perches.	High Probability	No. Agricultural, meadow and pasture habitat communities are present within the study area that meet the size requirements for this species (minimum 5 ha). During the field investigations,

APPENDIX E: SPECIES AT RISK LIKELY TO OCCUR WITHIN THE POWER DAM DRIVE AND HIGHWAY 401 STUDY AREA

Species Grouping	Species Common Name	SARA Status	*ESA Status	Habitat Requirements	Associated ELC Communities	Suitable Habitat Present within Study Area	Species/Habitat Observed During Field Investigations
				Scattered trees, shrubs, telephone poles and fence posts are used as elevated song perches.			Eastern Meadowlark individuals were observed within the Open Agriculture (OAG) community situated east of Power Dam Drive and south of Highway 401. Eastern Meadowlark were not observed during field investigations, confirming the presence of preferred nesting habitat for this species.
Herpetofauna	Eastern Musk Turtle (<i>Sternotherus odoratus</i>)	SC	SC	- Habitat preference is in littoral zones and shallow waterways with slow to no current and soft bottom due to the warmer water temperatures. Abundant floating and submerged aquatic vegetation is also important for foraging. - Nesting habitat is mostly found on shore, adjacent to water as they prefer to stay near water and avoid long distance travel for nesting. Nests are usually made 3 to 11 m from the shore in sand, decaying vegetation, at the base of dune grass or in rotting wood.	SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present	Low Probability	No. The Shallow Aquatic (SAM1) communities present within the study area are small in size and isolated from other watercourse or wetland features that the Eastern Musk Turtle would utilize throughout its life cycle. Eastern Musk Turtle was not observed during the field investigations.
Avifauna	Eastern Wood-pewee (<i>Contopus virens</i>)	SC	SC	- Habitat preference is a mid-canopy layer of forest clearings and edges of deciduous and mixed forests. - Most abundant in intermediate-aged and mature forest stands with little understory vegetation.	FOC, FOM, FOD, SWD, SWM and CUW	Moderate Probability	Yes. Forest edge habitat is present within the forested communities (FOM FODM4 and FODM6) present within the study area. Eastern Wood-pewee was not observed during field investigations.
Avifauna	Least Bittern (<i>Ixobrychus exilis</i>)	THR	THR	- Prefers wetland habitats for nesting, favoring cattail marshes with a mix of open pools and channels. - Nests are built above water within dense vegetation - This species eats mostly small frogs, small fish and aquatic insects.	SA and MAS communities densely vegetated with pools and channels.	Low Probability	No. The Shallow Aquatic (SAM1) and meadow marsh (MASM1-1 and MAMM3) communities present within the study area are isolated from similar features and small in size, unlikely to provide preferred habitat for this species. Least Bittern was not observed during field investigations.
Herpetofauna	Midland Painted Turtle (<i>Chrysemys picta marginata</i>)	SC	NAR	- Habitat occurs in slow moving, shallow and well-vegetated wetlands and water bodies that have an abundant number of basking sites and organic substrates. This mostly includes swamps, marshes, ponds, fens and bogs. - Foraging habitat is usually in wetlands with shoreline and submergent vegetation. - Nesting habitat is in sun-exposed areas with loose soil and low vegetation cover. Examples are shorelines of lakes and wetlands, beaver dams and sand dunes. They also use gravel shoulders of roads; however they usually prefer to stay near water.	SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present	Low Probability	No. The Shallow Aquatic (SAM1) and marsh (MASM1-1 and MAMM3) communities present within the study area are small in size and isolated from other watercourse or wetland features that the Midland Painted Turtle would utilize throughout its life cycle. Midland Painted Turtle was not observed during the field investigations.
Herpetofauna	Northern Map Turtle (<i>Graptemys geographica</i>)	SC	SC	Habitat includes rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer.	SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present	Low Probability	No. The Shallow Aquatic (SAM1) and marsh (MASM1-1 and MAMM3) communities present within the study area are small in size and isolated from

APPENDIX E: SPECIES AT RISK LIKELY TO OCCUR WITHIN THE POWER DAM DRIVE AND HIGHWAY 401 STUDY AREA

Species Grouping	Species Common Name	SARA Status	*ESA Status	Habitat Requirements	Associated ELC Communities	Suitable Habitat Present within Study Area	Species/Habitat Observed During Field Investigations
				- In winter, the turtles hibernate on the bottom of deep, slow-moving sections of river. - They require high-quality water that supports the female’s mollusc prey. - Their habitat must contain suitable basking sites, such as rocks and deadheads, with an unobstructed view from which a turtle can drop immediately into the water if startled			other watercourse or wetland features that the Northern Map Turtle would utilize throughout its life cycle. Northern Map Turtle was not observed during the field investigations.
Herpetofauna	Snapping Turtle <i>(Chelydra serpentina)</i>	SC	SC	- Habitat occurs in slow moving, shallow and well-vegetated wetlands and water bodies that have an abundant number of basking sites and organic substrates. This mostly includes swamps, marshes, ponds, fens and bogs. - Foraging habitat is usually in wetlands with shoreline and submergent vegetation. - Nesting habitat is in sun-exposed areas with loose soil and low vegetation cover. Examples are shorelines of lakes and wetlands, beaver dams and sand dunes. They also use gravel shoulders of roads; however they usually prefer to stay near water.	AO, SA near gravelly or sandy areas.	Low Probability	No. The Shallow Aquatic (SAM1) and marsh (MASM1-1 and MAMM3) communities present within the study area are small in size and isolated from other watercourse or wetland features that the Snapping Turtle would utilize throughout its life cycle. Snapping Turtle was not observed during the field investigations.
Avifauna	Wood Thrush <i>(Hylocichla mustelina)</i>	SC	SC	- Breeding habitat includes moist, deciduous hardwood or mixed stands previously disturbed. These stands usually have a thick deciduous undergrowth and tall trees which are used as singing perches. - Nesting usually takes place in lower elevations with a closed canopy cover and a high variety of deciduous tree species. - These areas are usually shaded with an open forest floor that has moist soil and decaying leaf litter.	FOD and FOM that are greater than 1 ha in size.	Moderate Probability	Yes. Moist, deciduous hardwood and mixed forest stands larger than 1 ha in size are present within the FOM5-2 and FOD2-1 communities surrounding the Highway 124 study area. These forests provide dense deciduous undergrowth and tall trees for singing perches. Wood Thrush was not observed during field investigations.
Insect	Monarch <i>(Danaus plexippus)</i>	SC	SC	- Throughout their life cycle, Monarchs use three different types of habitats. - Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. - Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Milkweeds (numerous species) are the sole food plant for Monarch caterpillars. These plants grow predominantly in open and periodically disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests.	AI, TP, and CUM where milkweed plants are present.	Low Probability	Yes. Milkweed plants and other nectar producing flowers were identified within the study area. Monarch was not observed during the field investigations.
Mammals	Bat Species <i>(Myotis sp.)</i>	END	END	- Breeding usually takes place in large-diameter trees and sometimes buildings. - Foraging habitat is found in forest gaps, along waterways, forest edges, or over water. Large open fields/clear-cuts are generally avoided. - Overwintering is typically in cold and humid hibernacula such as caves and mines.	FOC, FOM, FOD, SWC, SWM and SWD where suitable roosting (i.e., cavity trees and trees with loose bark) habitat is available.	High Probability	Yes. The forested communities within the study area (FOM, FODM4 and FODM6) may provide suitable maternity roosting habitat, as candidate bat cavity trees are present (greater than 25 cm DBH, cavity holes, peeling bark). Bat species were not observed during field investigations.

- Low Probability: Suitable habitat for the species is not likely present within the study area
- Moderate Probability: Potentially suitable SAR habitat may be present within the study area
- High Probability: Preferred habitat conditions for SAR are likely present within the study area

**Appendix E – Fish and Fish Habitat Existing Conditions and
Preliminary Impact Assessment Report, Highway 401 Power Dam
Bridge**

Fish and Fish Habitat Existing Conditions and Preliminary Impact Assessment Report

Preliminary Design and Environmental Assessment

Highway 401 Power Dam Bridge

Ministry of Transportation, Eastern Region

Agreement No. 4019-E-0023, Assignment No. 4

G.W.P. 4092-19-00

Presented to:

Steve Baczyk
Environmental Planner

Ministry of Transportation
1355 John Counter Boulevard
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Project No. 201979404

April 17, 2024

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1. INTRODUCTION

1.1 Overview and Purpose

Morrison Hershfield Limited (MH) has been retained by the Ontario Ministry of Transportation (MTO) Eastern Region to prepare the Preliminary Design and complete a Class Environmental Assessment (EA) Study for the conceptual design of a bridge which carries Power Dam Drive over Highway 401 (Site No. 013X-180/BO) including interchange modifications, near the town of Cornwall Ontario. The proposed bridge replacement and interchange modifications are planned for an existing transportation facility (Highway 401), which are intended to accommodate movements in all directions, and to address increased traffic demands, and operational and safety concerns. As such, it is classified as a Group B Project under the *MTO Class Environmental Assessment for Provincial Transportation Facilities* (2000).

As part of the EA process, an evaluation of preliminary design alternatives was completed for the project to determine the preferred design based on a number of feasibility elements. Initially, ten (10) design alternatives were proposed for the Highway 401 and Power Dam Drive interchange; and subsequently six were selected to move forward with further studies before one was selected as the preferred (Alternative 8). In order to support the Preliminary Design and Class EA Study, fish and fish habitat existing conditions assessments within the study area were required. Watercourses located within the project study area were generally found to support low sensitivity bait/forage fish habitat.

This report provides a synopsis of the site-specific constraints and opportunities, sampling plan rationale, and detailed existing conditions of fish and fish habitat within the study area. Environmental information used for the production of this report has been assembled from background sources, direct correspondence with regulatory agencies, as well as from current field data specifically collected for this project. This report also provides a high-level overview of the works that MTO is proposing to undertake within the study area and the associated works that could potentially affect fish and fish habitat. This report has been assembled in accordance with the requirements of the Interim *Environmental Guide for Fisheries* (April 2020) and the *PILOT – MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings* (April 2020).

1.2 Project Location

The location of the interchange is near the community of Cornwall, approximately 2.9 km west of the intersection between Highway 401 and Highway 138, which falls within the Township of South Stormont, within the United Counties of Stormont, Dundas and Glengarry. The study area is located within the Kemptville District of the Ministry of Natural Resources and Forestry (MNRF), as well as the jurisdiction of the Raisin Region Conservation Authority (RRCA).

Currently, an overpass carries traffic north to south along Power Dam Drive, over Highway 401. The partial interchange's current configuration only allows exit from Highway 401 eastbound and entrance to Highway 401 westbound. The proposed (new) bridge replacement will consider any future interchange improvements during the service life of the structure.

Figure 1 provides an overview of the Study Area at the existing intersection between Power Dam Drive and Highway 401.

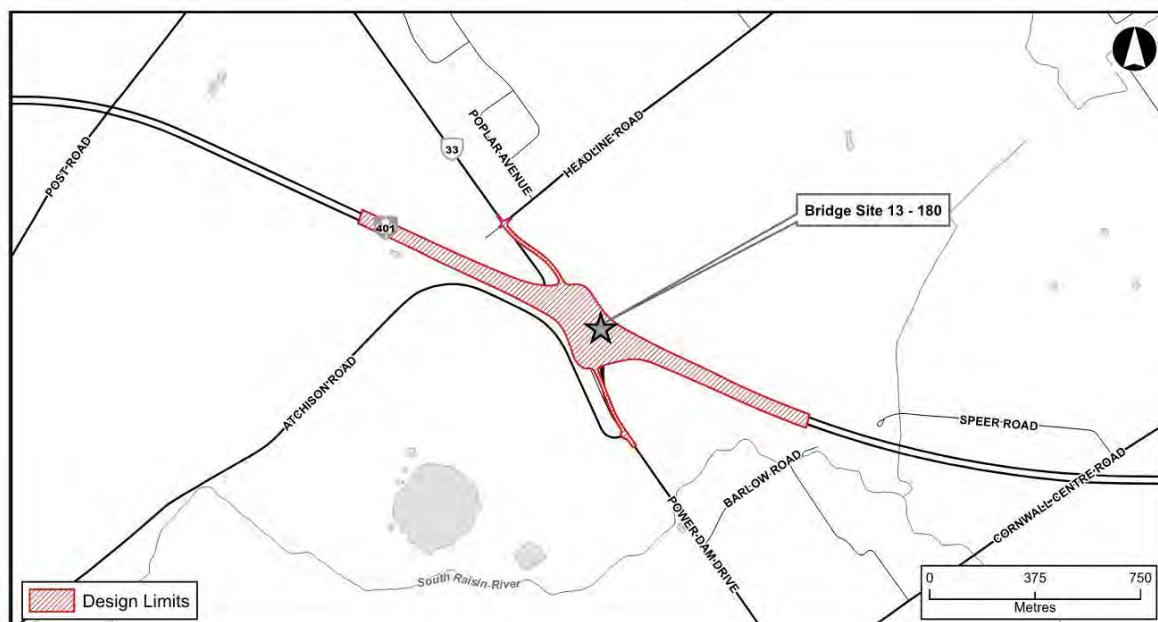


Figure 1: Key Map of the Study Area for the Highway 401 and Power Dam Road Interchange.

Table 1 below provides a summary of the culvert locations within the Study Area, including G.W.P., watercourse/culvert station, highway, Township, and coordinates.

Table 1: Location of proposed work at centreline culverts within the project study area.

GWP	Waterbody ID	Highway	Township	Latitude / Longitude
4092-19-00	C1	Hwy 401 (Median)	South Stormont	45.063125° - 74.819212°
	**C2	Hwy 401 (EB/WB)		45.063184° - 74.819353°
	C3	Hwy 401 (EB)		45.060453° - 74.812890°
	C4	Power Dam Dr.		45.060521° - 74.811270°
	C5/6	Hwy 401 (EB/WB)		45.059383° - 74.809736°
	C7	Hwy 401 EB Off-ramp		45.058840° - 74.810098°
	C8	Power Dam Dr.		45.058686° - 74.808858°
	C9	Power Dam Dr.		45.057805° - 74.809027°
	C10	Power Dam Dr.		45.060124° - 74.810486°
	C11/12	Power Dam Dr.		45.059877° - 74.809761°
	C13	Power Dam Dr.		45.058189° - 74.808858°
	C14	Power Dam Dr.		45.057985° - 74.808894°
	C15	Power Dam Dr.		45.057772° - 74.809026°
	C16	Power Dam Dr.		45.057174° - 74.808937°
	**C17	Power Dam Dr.		45.055839° - 74.808333°
	**C18	Atchison Rd.		45.055843° - 74.809229°
	C19/20	Hwy 401 (EB/WB)		45.058131° - 74.807027°
	C21	Hwy 401 (EB/WB)		45.057432° - 74.804937°
	**C22/23	Hwy 401 (EB/WB)		45.056642° - 74.803379°
	C24	Hwy 401 (EB)		45.054732° - 74.797442°
	**C25	Hwy 401 (EB/WB)		45.054434° - 74.795805°
	C26	Hwy 401 (Median)		45.054399° - 74.795675°

**Direct Fish Habitat

2. CONSTRAINTS AND OPPORTUNITIES

Several biological constraints, as they relate to fish and fish habitat exist within the Highway 401/Power Dam Drive study area. Although historical, the study area has been previously disturbed, and no new watercourse crossings, watercourse realignments, or major alterations to study area watercourses have been proposed.

Background research and field studies coupled with agency consultation were used in the determination of habitat function and significance, including:

- Significant fish habitat
- Flow (i.e., ephemeral, intermittent or permanent) and flow direction
- Potential barriers to fish passage up or downstream of the site (e.g., dams/weirs, perched culvert, undersized CSP, beaver dam, down cutting of channel)
- Thermal regime (i.e., cool, cold or warm water)
- Fish habitat type (i.e., not fish habitat, indirect habitat, direct habitat, spawning areas, migratory routes)
- Environmentally sensitive areas (e.g., ground water upwellings, wetlands)
- Potential areas for enhancement or offsetting
- Waterbody bank erosion
- Special habitat features that present a constraint or allow for an opportunity to be considered in the design
- Other important environmental constraints

In general, opportunities and constraints were limited throughout the study area given that MH found marginal/low quality, baitfish habitat during 2022 investigations. Multiple unnamed tributaries of South Raisin River within the study area were found to support direct fish habitat including common bait/forage fish species to the region. As confirmed by the MNRF Kemptville District, all surface water features within the study area were classified as warmwater, with an appropriate in-water timing window of (works permitted) from July 1st to March 14th of any given year, where fish habitat exists either directly or indirectly.

Figure 2 below indicates the areas of opportunities and constraints with respect to fish and fish habitat in the Highway 401/Power Dam Drive study area.

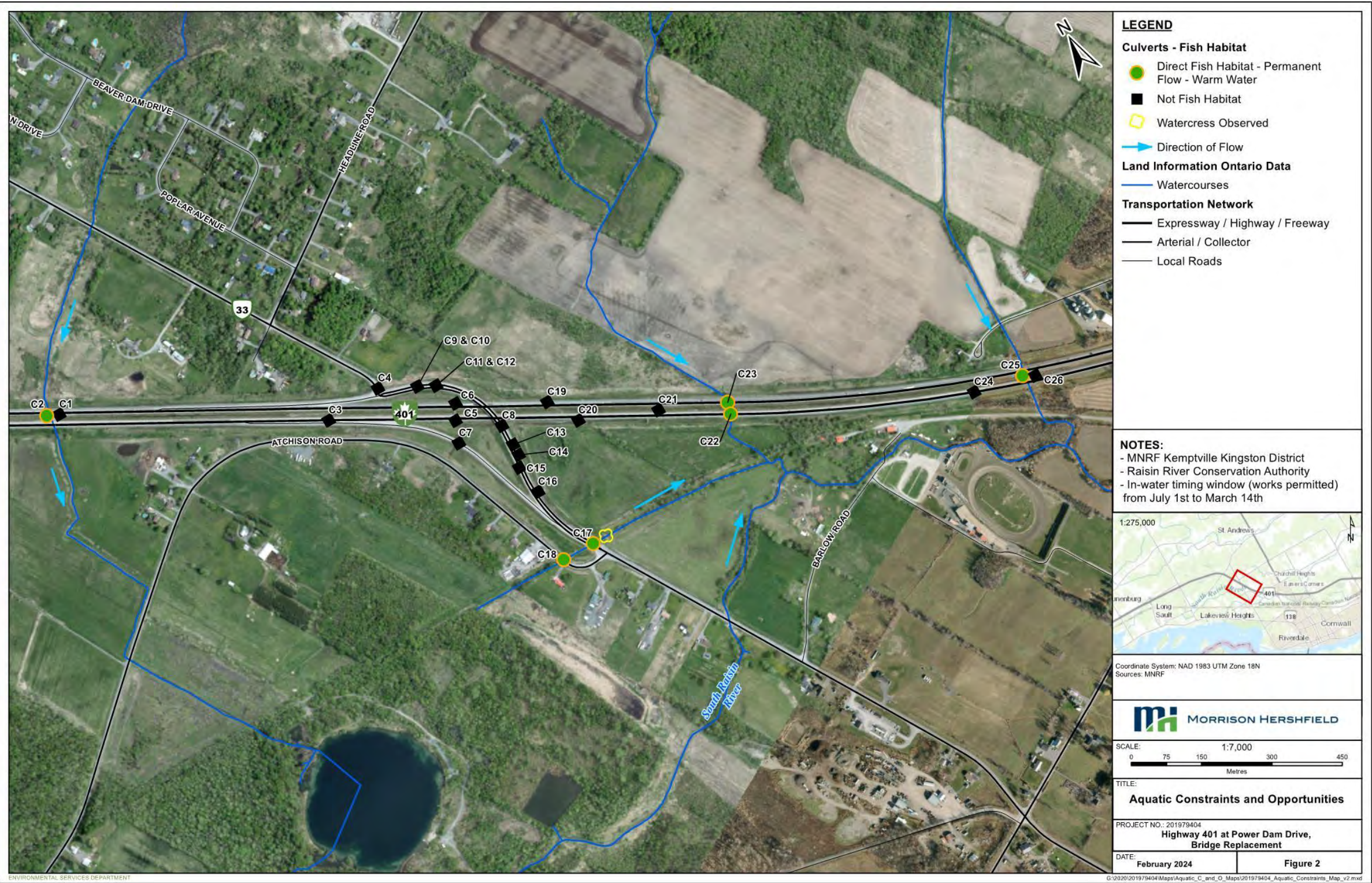


Figure 2: Aquatic Constraints and Opportunities within the Study Area.

3. BACKGROUND DATA COLLECTION

Background data collection is important in determining past environmental conditions of the study area. For the purposes of this study, a number of online sources were accessed as well as correspondence with the MNRF – Kemptville District Office, and the MTO Environmental Planner. Background information regarding the study area was collected and synthesized from the following online sources:

- Natural Heritage Information Centre (NHIC)
- Land Information Ontario (LIO)
- Fish ON-Line
- Fisheries and Oceans Canada (DFO) Aquatic SAR mapping
- *Species at Risk Act* (SARA) Public Registry
- Natural Resources Canada – Toporama
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps
- Aerial photography

3.1 Study Area Overview

To obtain a general understanding of the watercourse/waterbody features within the project area, various online mapping tools were used including, but not limited to, Toporama, Google Earth, and LIO database layers. Upon review of these resources, it was determined that four mapped watercourses exist with the study area, all of which include unnamed tributaries of the South Raisin River. Three of the tributaries cross Highway 401 from north to south, one existing west of Power Dam Drive and two existing to the east of Power Dam Drive. The fourth unnamed tributary crossed from west to east beneath Power Dam Drive approximately 0.3 km south of Highway 401. All tributaries within the study area converge with the South Raisin River within approximately 1 km or less, downstream of the culvert crossing. The South Raisin River crosses from west to east beneath Power Dam Drive approximately 0.7 km south of Highway 401; however, this watercourse falls outside of the project footprint.

3.2 Fish and Fish Habitat

Prior to consultation with the MNRF, background data specific to fish and fish habitat (i.e., thermal regime, fish community) were collected from the MNRF Fish ON-Line mapping tool, and the Aquatic Resource Area (ARA) mapping layer within the LIO database. Upon review of the available online resources, the South Raisin River was identified as a permanent watercourse that supports a number of cool/warmwater fish species, including sportfish such as Walleye (*Sander vitreus*) and Northern Pike (*Esox lucius*). In addition, an unnamed tributary existing to the west of the Highway 401/Power Dam Drive intersection was identified to support common baitfish species including Brook Stickleback (*Culaea inconstans*), Creek Chub (*Semotilus atromaculatus*), and Northern Redbelly Dace (*Chrosomus eos*).

Following review of background data provided by MTO and publicly available resources, the information was compiled within an Information Request/Request to Confirm Letter that was submitted to the local MNRF Kemptville District Office on December 16, 2021. A response was received on June 2, 2022, after multiple follow-up emails. The MNRF indicated that the South Raisin River and its tributaries are classified as warmwater systems, however, the management biologist identified one additional fish species that would be present within the South Raisin River, which included Burbot. No Fisheries Management Objectives (FMO's) were identified for the project area. Due to the presence of warmwater fish species within South Raisin River as well as one winter spawning species (Burbot), the in-water work timing window for the South Raisin River specifically (works permitted) is from July 1 to December 31. However, the appropriate window for the unnamed tributaries throughout the study area would be (works permitted) from July 1 to March 14 of any given year.

Additionally, an Information Request was sent to the Raisin Region Conservation Authority (RRCA) on April 19, 2022, and a follow-up was sent on June 15, 2022. A response was received on June 20, 2022. The RRCA stated that the unnamed tributary of South Raisin River existing furthest to the east of the interchange (C25) is classified as Class E under the Guidance for Maintaining and Repairing Municipal Drains in Ontario (DFO, 2017); however, no additional information was provided. As stated within the Guidance for Maintaining Municipal Drains in Ontario (2017), a Class E drain is known to support permanent flow with spring spawning fish species that are part of a Commercial, Recreational, and/or Aboriginal fishery (as defined under the previous *Fisheries Act* version). Communications with MNRF and RRCA have been included in **Appendix A**.

3.3 Provincial Aquatic Species at Risk

Background data pertaining to provincially listed aquatic SAR is primarily obtained through two resources. An initial screening of the site was completed through reviewing the online mapping tool that is made available by Ministry of Environment, Conservation and Parks (MECP) through the Natural Heritage Information Centre (NHIC) Make A Map web resource. Upon review of data squares 18WQ1489, 18WQ1589, and 18WQ1588 within the NHIC mapping tool which encompasses the study area, there were no provincial aquatic SAR occurrences discovered.

To confirm the accuracy of the information obtained from NHIC mapping tool, an information request was submitted to the MTO Environmental Planner on January 14, 2022, due to their data access agreement with NHIC. The MTO Environmental Planner responded on February 28, 2022, and noted the potential presence of one aquatic SAR within the study area including Cutlip Minnow (*Exoglossum maxillingua*) which is listed as Threatened under the provincial *Endangered Species Act* (ESA). However, no specific location information was available with respect to the occurrence of Cutlip Minnow within the project study area. Based on review of the NHIC web resource, Cutlip Minnow was identified within data square 18WQ1390 which exists immediately west of the project study area including an unnamed tributary of the Raisin River. Given that this tributary of Raisin River included within square 18WQ1390 is part of a separate sub-watershed compared to the tributaries within the study area (South Raisin River tributaries), it is deemed unlikely that this species exists within the study area. The SAR information provided within the correspondence with the MTO Planner is considered confidential and has therefore been redacted to contain only the info above.

3.4 Federal Aquatic Species at Risk

An online mapping database for federally listed aquatic SAR is made available by Fisheries and Oceans Canada (DFO) through the Aquatic Species at Risk Map web resource. Upon review of the online mapping tool, there were no federally listed aquatic SAR identified within the general project area. However, it should be noted that Cutlip Minnow which is listed as Special Concern under Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was identified within the Raisin River (north of the project location) in the DFO aquatic SAR mapping tool which further confirms the location information discussed above in **Section 3.3**. Therefore, Cutlip Minnow is not believed to exist within the project study area.

4. FIELD INVESTIGATIONS

4.1 Sampling Plan and Rationale

Spring and summer fish and fish habitat field investigations were completed throughout the study area, with the spring visit taking place on April 11, 2022 and the summer investigation taking place on June 29, 2022. Field investigations were completed in accordance with Section 5 of the Fish Guide, with a specific focus on confirming presence/absence of fish habitat, as well as identifying any areas of seasonal habitat. Each investigation included an assessment of habitat conditions from approximately 50 m upstream to 200 m downstream of each watercourse crossing, however, property constraints within the project area limited the assessment coverage. Fish community sampling was completed through both backpack electrofishing and dip netting under a valid License to Collect Fish for Scientific Purposes (LCFSP) obtained from the MNRF Kemptville District. A copy of the signed LCFSP (No. 1099910) that was obtained from the MNRF on January 25, 2022, has been included with the MNRF correspondence/information request in **Appendix A**. The photographic record of each project location is provided in **Appendix B** and all field data was recorded on MTO Field Collection Record forms which are included in **Appendix C**.

4.2 Existing Fish and Fish Habitat

4.2.1 Culvert C2 – Unnamed Tributary of the South Raisin River

The unnamed tributary of the South Raisin River at culvert C2 was conveyed north to south beneath both eastbound and westbound lanes of Highway 401 through an open bottom concrete culvert. Both spring and summer fish and fish habitat investigations were constrained by a property fence along the highway right-of-way (ROW), therefore, fish and fish habitat attributes were only assessed within the ROW including 15 – 20 m from each culvert end. However, general observations were made along the channel segments beyond the ROW area without accessing the fenced area. The upstream channel of the tributary flowed through a hydro corridor leading up to the highway ROW which supported dense low-lying vegetation such as juvenile trees, shrubs, grasses, sedges and forbs. Based on review of aerial imagery, the watercourse originated from a wetland located approximately 0.8 km upstream of the highway, immediately east of Beaver Dam Drive. The highway embankment

surrounding the culvert inlet was steep but appeared stable as it was well-vegetated. The upstream channel within the study reach was well defined with subtle meanders, and the most dominant morphological feature included runs. A pool was also observed during the spring investigation approximately 10 m upstream of the inlet and a continuous run was observed during the summer. At the culvert inlet, a boulder/cobble cascade was present which included a grade change of approximately 0.4 m during the spring investigation from channel invert to channel invert. Refer to **Table 1** for a summary of the spring morphological characteristics and substrate conditions within the upstream channel segment. Channel banks were found to be slightly unstable given the visible bank undercutting within the Highway ROW. In terms of instream habitat, coarse substrate as well as undercut banks provided the majority of habitat opportunities in spring. Dense overhanging vegetation including grasses, sedges, cattails, and forbs provided overhead cover/channel shading in the summer. The boulder/cobble cascade at the inlet was considered a seasonal barrier to fish passage, as depending on water levels, fish may be able to pass the cascade. Habitat observed within the upstream reach was considered moderate quality due to the presence of dense riparian vegetation as well as instream habitat features such as bank undercutting and coarse substrate.

Table 2: Summary of the Upstream Morphological Features at C2 (unnamed tributary of South Raisin River)

Feature/ Section	Percentage of Area	Mean Depth (m)	Mean Wetted Width (m)	Mean Bankfull Depth (m)	Mean Bankfull Width (m)	Substrates
Run	90	0.5	0.9	0.7	3.0	Cobble, boulder gravel, sand, silt, detritus
Pool	10	0.6	1.1	0.8	3.2	Cobble, gravel, sand, silt, detritus

The downstream channel was also well defined and flowed for approximately 15 m within the Highway ROW before entering private property comprised of a pasture field containing cattle. The channel beyond the ROW lacked riparian vegetation and bank erosion/slumping was observed throughout both channel banks. Based on review of aerial imagery, the downstream channel connects to a pond approximately 1.2 km downstream which appeared to be a decommissioned quarry based on the characteristics observed in the aerial imagery, such as land disturbance, access routes and adjacent active quarries. From the pond outlet, the watercourse continued approximately 0.3 km to the South Raisin River. Within the Highway ROW, multiple mature trees were present along the east channel bank and the majority of the Highway ROW clearing was comprised of grasses and herbaceous species which was observed to be manicured during the summer investigation aside from the crest of the channel banks. The channel morphology within the Highway ROW consisted of a run during the spring investigation with a pool approximately 5 m downstream of the outlet. During the summer investigation, a riffle was present at the outlet of the culvert followed by a pool, short riffle section and then lastly a run leading to the property fence. Refer to **Table 3** for a summary of the spring morphological characteristics and substrate conditions observed within the downstream channel reach. Channel banks were considered slightly unstable/vulnerable due to observations of bank undercutting as well as localized slumping

along the east bank at the outlet as well as the channel section downstream of the ROW where riparian vegetation was absent. Instream habitat was dominated by undercut banks as well as scattered coarse substrate. Overhanging vegetation also provided overhead cover during the summer investigation. Overall, habitat observed within the downstream channel beyond the Highway ROW was highly impacted by agricultural land use and as a result, was considered low quality when compared to the upstream channel.

Table 3: Summary of the Downstream Morphological Features at C2 (unnamed tributary of South Raisin River).

Feature/ Section	Percentage of Area	Mean Depth (m)	Mean Wetted Width (m)	Mean Bankfull Depth (m)	Mean Bankfull Width (m)	Substrates
Run	90	0.19	1.45	1.0	2.35	Clay, cobble, boulder gravel, sand, detritus
Pool	10	0.5	2.4	1.35	3.2	Clay, boulder, cobble, gravel, silt

Fish community sampling was completed by backpack electrofishing during both the spring and summer surveys. Sampling during the spring resulted in the capture of two Central Mudminnow (*Umbra limi*) and one Creek Chub within the downstream channel. Effort within the upstream channel during the spring resulted in no catch. Sampling during the summer investigation resulted in the capture of multiple young-of-year (YOY) baitfish within the upstream channel including Northern Redbelly Dace, and Brook Stickleback. Sampling within the downstream reach resulted in no catch during the summer, however, multiple adult baitfish were observed. Capture of YOY baitfish suggests that nursery and potentially spawning habitat for common baitfish species exists in proximity to the Highway 401 culvert. Water quality parameters collected during the spring survey included a water temperature of 4.2°C, pH of 8.25, and conductivity of 472 µS/cm. The air temperature during the spring investigation was 3°C. During the summer survey, the water quality parameters collected included a water temperature of 17.1°C, pH of 7.53, conductivity of 760 µS/cm, and dissolved oxygen concentration of 8.50 mg/L. The air temperature was 21°C during the summer investigation. The water colour was yellow/brown throughout the surveyed reaches during the spring and clear during the summer investigation.

4.2.2 Culvert C17/18 – Unnamed Tributary of the South Raisin River

The unnamed tributary of the South Raisin River was conveyed west to east under Atchison Road through a corrugated steel pipe (CSP) culvert (C18) and continued east for approximately 45 m to where it was conveyed beneath Power Dam Drive through a second CSP culvert (C17). The area surveyed during the MH spring and summer investigations consisted of the Atchison Road ROW upstream of C18, to the Power Dam ROW downstream of Power Dam Drive for a total length of approximately 100 m including the lengths of both C17 and C18. Based on review of aerial imagery, the unnamed tributary appears to run parallel to a decommissioned rail line as the entire length of the tributary is channelized, however, its source is unclear. The tributary flows approximately 450 m east

from C17 to where it connects to the South Raisin River. The channel section throughout the surveyed areas existing from the upstream side of C18 to the downstream side of C17 was mainly comprised of a continuous run which lacked sinuosity as it was channelized. The average morphometry within runs during the spring investigation included a depth of 0.3 m, width of 2 m, bankfull depth of 0.65 m and bankfull width of 5.5 m. Flow conditions observed during the summer were dramatically different and included a mean depth of 0.2 m and mean width of 1.1 m. An outlet pool was observed at C18 as well as a localized flats area downstream of C17; however, channel morphology was generally homogenous. In terms of riparian vegetation, manicured grass existed along the channel segment between C17 and C18, however mature trees as well as shrubs, grasses and forbes were present along channel banks upstream of Atchison Road and downstream of Power Dam Drive. Substrate observed throughout the study reach included gravel, clay, sand, silt, muck and detritus. During the summer investigation, evidence of fording by the mower (in the form of tire tracks/cut vegetation) was observed within the channel segment existing between C17 and C18. Based on this observation, it is possible that the tributary possesses an intermittent flow regime during dry years as it is unlikely the mower traversed a flowing watercourse. Intersecting ditchlines tied into the channel upstream and downstream of Atchison Road which were inundated during the spring but found dry during the summer investigation. Approximately 10 m downstream of C17, the channel was conveyed beneath a farm entrance where bank erosion/slumping was observed. The main instream habitat feature included emergent vegetation, which was dominated by grasses, as well as Water Plantain (*Alisma subcordatum*), and scattered cattails (*Typha* sp.). Watercress (*Nasturtium officinale*) was also observed at the inlet/outlet of C18 which suggests that the unnamed tributary receives groundwater inputs.

Fish community sampling was completed by backpack electrofishing during the spring and by dip-netting in summer. Sampling during the spring resulted in the capture of five bait/forage fish species including, Central Mudminnow, Creek Chub, Common Shiner (*Luxilus cornutus*), White Sucker (*Catostomus commersonii*), and Blacknose Dace (*Rhinichthys obtusus*) within the channel section between C18 and C17. Baitfish species listed above were found to be abundant during the spring investigation. Dip-netting within the same channel segment during the summer resulted in the capture of multiple juvenile Central Mudminnow and one adult Brook Stickleback. Water quality parameters collected during the spring survey included a water temperature of 10.1°C, pH of 8.62, and conductivity of 411 µS/cm. The air temperature during the spring investigation was 12°C. During the summer survey, the water quality parameters collected included a water temperature of 17.5°C, pH of 7.39, conductivity of 860 µS/cm, and dissolved oxygen concentration of 5.16 mg/L. The air temperature was 21°C during the summer investigation. Despite the lack of morphological diversity observed by MH within the unnamed tributary, the habitat was quality enough to support a diverse and abundant bait/forage fish community during the spring investigation, which leads to the determination that seasonal usage/dependence is high for the local bait/forage fish community.

4.2.3 Culvert C22/23 – Unnamed Tributary of the South Raisin River

The unnamed tributary of the South Raisin River at Culvert C22/23 was conveyed from north to south under Highway 401 westbound and eastbound lanes through two separate concrete culverts. Based on review of aerial imagery, the tributary originates from a wetland

pocket approximately 1.2 km northeast of the culvert and the surrounding landuse is generally made-up of agricultural property. Downstream of Highway 401, the tributary channel flows for approximately 200 m until it joined the South Raisin River channel. The area assessed during the 2022 spring and summer investigations was limited to the channel segments within the Highway 401 ROW. The Highway ROW was comprised of manicured grass throughout the upstream and downstream study reaches and the channel flowed through/along agricultural fields north and south of the ROW. The upstream channel consisted of a narrow, defined channel that lacked sinuosity and consisted of run morphology, including a mean depth of 0.15 m, width of 0.8 m, bankfull depth of 0.35 m and bankfull width of 1.2 m during the summer. Substrate was comprised of clay, muck, silt, and gravel near the culvert inlet. Evidence of fording by a mower was observed within the upstream channel during the summer investigation. The main habitat feature upstream included emergent grasses which was manicured within the ROW. The downstream channel consisted of flats morphology within a grass swale as no defined banks were present. The mean wetted depth during the summer was 0.2 m and the width was 3.0 m. A debris jam was observed at the property fence which bordered the Highway ROW and caused backwatering of the downstream channel. Flow was observed to be minimal downstream of the property fence during the summer which was identified as a potential seasonal low flow barrier to fish passage. Instream habitat within the downstream reach was homogenous and consisted of emergent grasses and filamentous algae. Evidence of fording by a ROW mower was also observed downstream during the summer investigation.

Fish community sampling was completed by backpack electrofishing during the spring and by dip-netting in summer. Sampling during the spring resulted in no catch at both the upstream and downstream channel segments. However, dip-netting in summer resulted in the capture of a single Brook Stickleback within the highway median between the two culvert ends. Water quality parameters collected during the summer survey included a water temperature of 16.1°C, pH of 7.90, conductivity of 550 µS/cm, and dissolved oxygen concentration of 8.10 mg/L. The air temperature was 20°C during the summer investigation. Overall, the habitat quality within the unnamed tributary was observed to be low quality and was considered homogenous. Although no groundwater indicators were observed during field investigations, the cool water temperature observed during the summer investigation suggests the possible presence of groundwater inputs.

4.2.4 Culvert C25 – Unnamed Tributary of the South Raisin River

The unnamed tributary of the South Raisin River at Culvert C25 was conveyed from north to south under Highway 401 westbound and eastbound lanes through one continuous concrete culvert which included a catch basin at the Highway median. Based on review of aerial imagery, the tributary originates from a wooded area approximately 1.2 km northeast of the culvert inlet and the surrounding landuse is generally made-up of agricultural, wood lots, and rural residential property. Downstream of Highway 401, the tributary channel flowed in a general south direction for approximately 200 m until it joined the South Raisin River channel. The area assessed during the 2022 spring and summer investigations was limited to the channel segments within the Highway 401 ROW due to private property restrictions. The Highway ROW was mainly comprised of manicured grass throughout the upstream and downstream study reaches, however, intact grasses and forbes existed along channel banks in the summer. The upstream channel was partially defined and flowed perpendicular

to the highway leading up the culvert inlet. Average morphometry during the spring included a depth of 0.3 m, width of 3.0 m, bankfull depth of 0.6 m and bankfull width of 4.0 m. Substrate was comprised of muck, silt, and detritus. Evidence of fording by a mower was observed within the upstream channel including tracks and cut vegetation during the summer investigation as water/flow was minimal. The main habitat feature upstream included emergent grasses which was manicured within the channel during the summer. The downstream channel consisted of flats morphology with partially defined banks. The average channel morphometry during spring included a depth of 0.25 m, width of 4.5 m, bankfull depth of 0.45 m and bankfull width of 5.5 m. A debris jam was observed at the property fence which bordered the Highway ROW and caused backwatering of the downstream channel which was considered a potential seasonal barrier to fish passage. Instream habitat within the downstream reach was homogenous and consisted of emergent grasses and filamentous algae. Evidence of fording by a ROW mower was also observed adjacent to the culvert outlet during the spring and summer investigations.

Fish community sampling was completed by dip-netting in spring and summer which resulted in the capture of Brook Stickleback at the culvert inlet during the spring and no catch in summer. Water quality parameters collected during the spring survey included a water temperature of 2.7°C, pH of 9.86, and conductivity of 462 µS/cm. The air temperature was 20°C during the summer investigation. Overall, the habitat quality within the unnamed tributary was observed to be low and was considered homogenous with respect to morphology and habitat features.

Refer to **Table 4** below for a summary of the existing fish habitat conditions and **Table 5** below for a summary of the existing fish community present within the project study area.

Table 4: Summary of Existing Fish Habitat Conditions.

Waterbody ID / Culvert Station	Date (DD/MM/YYYY)	Flow Regime	Thermal Regime	Fish Habitat*	Substrate Type	Channel Morphology	Vegetation	Constraints and Opportunity	Significant Fish Habitat
Unnamed Tributary of South Raisin River – C2	Spring: April 11, 2022 Summer: June 29, 2022	Permanent	Warmwater	Direct	Clay, cobble, boulder gravel, sand, silt, detritus	Run, riffle, pool	Riparian: Scattered deciduous trees, grasses, sedges, cattails and forbes Instream: none	Potential seasonal barrier to fish passage at culvert inlet (boulder/cobble cascade)	None identified
Unnamed Tributary of South Raisin River – C17/18	Spring: April 11, 2022 Summer: June 29, 2022	Permanent	Warmwater	Direct	Gravel, clay, sand, silt, muck, detritus	Run	Riparian: Grasses, sedges, cattails and forbes Instream: Water Plantain, grasses, Watercress	Watercress observed surrounding C17 – indicates potential groundwater inputs	None identified
Unnamed Tributary of South Raisin River – C22/23	Spring: April 11, 2022 Summer: June 29, 2022	Permanent	Warmwater	Direct	Gravel, clay, muck, silt	Run, flats	Riparian: Grasses Instream: Grasses	Potential low flow barrier at south side of ROW due to debris jam at property fence	None identified
Unnamed Tributary of South Raisin River – C25	Spring: April 11, 2022 Summer: June 29, 2022	Permanent	Warmwater	Direct	Muck, silt, detritus	Runs, flats	Riparian: Grasses, forbes Instream: Grasses	Potential seasonal barrier at south side of ROW due to debris jam at property fence	None identified

* Fish habitat is defined in subsection 2(1) of the Fisheries Act is water frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes spawning grounds and nursery, rearing, food supply and migration areas.

Table 5: Summary of Existing Fish Community.

Waterbody ID / Culvert Station	Date (DD/MM/YYYY)	Fish Species Present	Year Class	Species at Risk Present	In-water Works Timing Window
Unnamed Tributary of South Raisin River – C2	Spring: April 11, 2022 Summer: June 29, 2022	MNRF/Online Resources: No data available MH 2022: Brook Stickleback, Central Mudminnow, Creek Chub, Northern Redbelly Dace	YOY/Adult	None	July 1 st to March 14 th (works permitted)
Unnamed Tributary of South Raisin River – C17/18	Spring: April 11, 2022 Summer: June 29, 2022	MNRF/Online Resources: No data available MH 2022: Blacknose Dace, Brook Stickleback, Central Mudminnow,	YOY/Adult	None	July 1 st to March 14 th (works permitted)

Waterbody ID / Culvert Station	Date (DD/MM/YYYY)	Fish Species Present	Year Class	Species at Risk Present	In-water Works Timing Window
		Creek Chub, Common Shiner, White Sucker			
Unnamed Tributary of South Raisin River – C22/23	Spring: April 11, 2022 Summer: June 29, 2022	MNRF/Online Resources: No data available MH 2022: Brook Stickleback	Adult	None	July 1 st to March 14 th (works permitted)
Unnamed Tributary of South Raisin River – C25	Spring: April 11, 2022 Summer: June 29, 2022	MNRF/Online Resources: No data available MH 2022: Brook Stickleback	Adult	None	July 1 st to March 14 th (works permitted)

5. PRELIMINARY ASSESSMENT OF POTENTIAL IMPACTS

5.1 Overview of Proposed Undertaking

Based on the Preliminary Design, the proposed interchange at Highway 401 and Power Dam Drive (G.W.P. 4092-19-00) will involve construction of new on/off ramps, as well as re-alignment of Power Dam Drive in the vicinity of the new bridge crossing. As a result, modification of existing culverts and drainage features are expected to be required, which have the potential to affect fish and fish habitat as discussed below.

In particular, the proposed N/S-E Ramp and W-N/S Ramp to the east of the new bridge will require widening of the Highway platform to accommodate speed change lanes for exit/entrance to the proposed ramps. As a result, culverts C22/C23 (direct fish habitat) will require extensions in order to accommodate the additional speed change lanes for the on/off ramps mentioned above. Due to the re-alignment of Power Dam Drive south of the proposed bridge crossing, the roadside drainage channels located east and west of Power Dam Drive will require re-instatement and it is expected that new drainage channel tie-ins will occur upstream and downstream of C17 (direct fish habitat). As well, it is expected that C17 will be replaced in order to meet the hydraulic design criteria. No work is proposed at culverts C18 and C25 which were also found to support direct fish habitat. In addition to the potential direct impacts mentioned above, general land-based works in proximity to fish habitat including, but not limited to, the use of equipment, grading, vegetation removal etc. has the potential to impact fish habitat if appropriate mitigation measures are neglected.

Refer to **Appendix D** for the preferred alternative used to complete this preliminary assessment of potential impacts. A summary of the proposed works at existing culverts is provided below in **Table 6**. For more information on drainage design components, refer to the *Preliminary Highway Drainage and Hydrology Report – Highway 401 / Power Dam Drive Interchange* (Morrison Hershfield, 2024).

Table 6: Preliminary Works Proposed at Existing Culverts.

Culvert ID	Highway	Fish Habitat	Proposed Works
C1	Hwy 401 (Median)	None	Replace
C2	Hwy 401 (EB/WB)	Direct Fish Habitat	Replace
C3	Hwy 401 (EB)	None	Trenchless Replacement
C4	Power Dam Dr.	None	None
C5/6	Hwy 401 (EB/WB)	None	Cleanout
C7	Hwy 401 EB Off-ramp	None	Replacement
C8	Power Dam Dr.	None	Cleanout
C9	Power Dam Dr.	None	Cleanout
C10	Power Dam Dr.	None	Cleanout
C11/12	Power Dam Dr.	None	Cleanout
C13	Power Dam Dr.	None	Cleanout
C14	Power Dam Dr.	None	Cleanout
C15	Power Dam Dr.	None	Cleanout
C16	Power Dam Dr.	None	Cleanout
C17	Power Dam Dr.	Direct Fish Habitat	Replacement
C18	Atchison Rd.	Direct Fish Habitat	None
C19/20	Hwy 401 (EB/WB)	None	Culvert Extension at EB/WB lanes
C21	Hwy 401 (EB/WB)	None	Culvert Extension
C22/23	Hwy 401 (EB/WB)	Direct Fish Habitat	Replacement at EB/WB lanes
C24	Hwy 401 (EB)	None	None
C25	Hwy 401 (EB/WB)	Direct Fish Habitat	None
C26	Hwy 401 (Median)	None	None

Notes:

Replacement of Culverts C1 & C2 is being completed by others under a separate project W.P. 4112-13-01 (Dillon, 2021).

5.2 Potential Impacts to Fish and Fish Habitat

As part of the proposed interchange, several activities have the potential to impact fish and fish habitat. Per the brief overview above, these activities include culvert extension, and drainage channel realignments due to new on and off ramps and roadway re-alignment, all of which may result in direct alteration or loss of habitat. In addition, general construction activities which have the potential to result in impacts to fish and fish habitat include (but are

not limited to) construction staging/site access, debris removal, material stockpiles, and site isolation/de-watering. Impacts which could result from the aforementioned activities may include sedimentation within downstream areas of either watercourse which has the potential to result in respiratory distress and reduced feeding efficiency of fish. Additionally, staging/site access and site isolation has the potential to result in temporary footprint increases depending on whether machinery can work from the existing ROW. It is expected that impacts to fish and fish habitat throughout the study area will be assessed during Detail Design, and therefore, potential impacts to fish and fish habitat are described at a high-level at this time. The preliminary assessment of potential impacts is provided in the sections below.

5.2.1 Culvert Replacement at C17

Culvert C17 located along Power Dam Drive approximately 330 m south of Highway 401 EBL was identified to support direct bait/forage fish habitat during the MH investigations. In addition, C18 also provides direct fish habitat, which is located on the same watercourse, approximately 45 m upstream of C17 at Atchison Road; however, no works are proposed at C18. Culvert replacement is proposed at C17 which has the potential to cause relatively minor impacts to the unnamed tributary. The main driver for the culvert replacement is to ensure that the culvert achieves hydraulic design criteria (freeboard and headwater depth). Refer to the *Preliminary Highway Drainage and Hydrology Report* (MH, 2024) for greater details regarding the hydraulic design criteria between existing and proposed. It is not anticipated that the culvert length will require extension, therefore, the main impacts from the culvert replacement are generally expected to be temporary in nature. Such impacts may include, but are not limited to, site isolation/de-watering, localized disturbance from excavation/grading at culvert ends, and temporary loss/disturbance of aquatic and/or riparian vegetation. Additionally, minor disturbance is also expected to occur at culvert ends where roadside drainage channels tie into the unnamed tributary. As per Step 3 of the Fish Guide, it should be confirmed at the Detail Design stage whether the replacement culvert meets the scope criteria of the Like-for-Like Culvert Replacement Best Management Practice (BMP). In the event that the BMP is not met, the habitat within the unnamed tributary was considered low quality and did not support any specialized or significant features, and as such, the intensity of potential residual effects from the culvert replacement are expected to be low. However, the potential residual effects at C17 would need to be reviewed in conjunction with impacts to fish habitat at other project locations that support fish habitat to determine the cumulative effect of fish habitat alteration/destruction for the entire project.

5.2.2 Culvert Replacement at C22/C23

Culvert C22 and C23 cross beneath Highway 401 eastbound and westbound lanes approximately 500 m east of the existing Power Dam Drive Bridge and convey flow for an unnamed tributary of the South Raisin River. Both culverts were identified to support low quality bait/forage fish habitat during MH field investigations. As part of the Power Dam Drive interchange configuration, speed change lanes required for entry and exit to/from Highway 401 will result in an increased width of the highway platform. As such, it is expected that the existing concrete box culverts will be replaced with longer box culverts that have increased capacity to achieve the hydraulic design criteria. Given that the

replacement culverts will have increased length, the proposed works at C22/23 is not expected to meet the criteria of any MTO BMP. In terms of potential impacts to fish habitat, the proposed replacements of C22/23 are expected to result in areas of habitat alteration and increased ecological footprints due to a proposed lengthened culvert compared to existing. Specifically, it is currently anticipated that the upstream culvert (C23) will require a 6.3 m extension along the north end, and the downstream culvert (C22) will require an 8.4 m extension along the south end. Given the existing culverts have a width of ~2.0m, the area permanent impact is expected to be approximately 13 m² at C23 and approximately 16.8 m² at C22. It is acknowledged that a portion of each footprint increase will include permanent destruction of fish habitat below the high-water mark due to the area occupied by new culvert footings/walls. However, it is anticipated that the area of permanent destruction will be approximately 5-10 m² at each culvert. The remainder of the impact would include habitat alteration through the construction of an enclosed culvert section along an area of open channel. Additionally, minor alteration would likely occur where drainage channels are re-aligned to tie-in with the new culvert ends. The existing habitat to be lost/alterd was considered low quality, homogenous habitat that included a narrow channel upstream of C23 with manicured grass within the MTO ROW and limited instream habitat features (i.e., emergent grasses). The channel segment downstream of C22 was swale-like and lacked defined banks as water/flow was observed to spawl throughout the ROW area adjacent to the culvert outlet. Overall, minimal fish usage/dependence was observed during the summer investigation, as only one Brook Stickleback was captured/observed within the Highway median between the two culverts. No other fish were captured or observed during the spring or summer investigations which suggests that the tributary at Highway 401 supports marginal direct fish habitat. In general, the culvert lengthening proposed at C22/23 is not expected to result in harmful alteration disruption or destruction (HADD) of fish habitat due to the low quality of habitat observed coupled with the low fish dependence. Furthermore, the scale and intensity of the impact are expected to be low given the non-sensitive habitat present. However, the potential residual effects to fish and fish habitat will need to be confirmed at Detail Design to confirm whether the proposed work at C22/23 has potential to result in HADD of fish habitat.

5.3 Preliminary Avoidance, Mitigation Measures and Design Considerations

As indicated through the sections above, there is a potential for multiple impacts to fish and fish habitat within the project study area. Avoidance of impacts was initially implemented through the alternatives analysis process as the potential impacts from each alternative was identified and then each alternative ranked based on the scale of impact. Further avoidance may be feasible during Detail Design through reduction of new footprints below the high-water mark to the greatest extent possible where culvert replacements are proposed.

Given the low sensitivity of the direct fish habitat identified within the study area, many of the potential impacts from construction activities are anticipated to be mitigated using standard provincial and MTO specifications. The exception, however, is the habitat alteration/loss which is expected to result from culvert extensions at C22/23. The effects of this impact (i.e., habitat loss/alteration) is likely not mitigable and has a low likelihood of resulting in HADD of fish habitat. The specific intensity and spatial scale of this residual effect would need to be further reviewed during Detail Design to confirm the likelihood of the project resulting in

HADD of fish habitat and requiring review by DFO through the Request for Review process. However, at this time it is considered unlikely that proposed work at C22/23 would warrant DFO review since the fish habitat to be altered was considered low quality and was found to support low baitfish dependence during MH 2022 investigations.

For most of the in-water works, protection of fish and fish habitat is expected to be achieved through implementation of the prescribed in-water timing window and the measures outlined within OPSS.PROV 182. Adhering to the MTO design standards as they relate to fish passage for culvert replacements (i.e., C17 and C22/23) is expected to be sufficient for maintaining passage. Mitigation of impacts to fish habitat from sources such as erosion and sedimentation that can occur during construction activities including, but not limited to, staging, vegetation clearing, dewatering, and stockpiling, are anticipated to be achieved through implementation and adherence to standard measures outlined within OPSS.PROV 180, OPSS.PROV 517, OPSS.PROV 804, and OPSS.PROV 805. Additional measures outlined within MTO standard special provisions (SSP), and non-standard special provisions (NSSP) are also anticipated to be applicable to the project during Detail Design in order to further mitigate potential impacts to fish and fish habitat. MTO special provisions that will likely be applicable include, but are not limited to:

- SSP 101F23 – Amendment to OPSS 182, April 2021 - Timing of In-Water Works, Oversight Requirements, and Measures to Avoid Harm to Fish
- Operational Constraint (Environmental) – General Environmental Protection Requirements
- Operational Constraint (Environmental) – Erosion and Sedimentation Control
- Operational Constraint (Environmental) – Management of Excess Earth with Salt Impacts
- Operational Constraint (Environmental) – Equipment Refueling, Maintenance and Washing
- Operational Constraint (Environmental) – Spill Prevention and Response Contingency Plan

A summary of the considerations for design and mitigation are provided below in **Table 7**.

Table 7: Summary of Design Considerations.

Factors to Consider	Design Considerations Provided by the Fisheries Assessment Specialist	Describe How Each Factor Was Addressed Through Design
In-water Works Timing Window	Works permitted from July 1 to March 14 at all areas of confirmed direct fish habitat, including unnamed tributaries of South Rasin River, Culvert C17 (Power Dam Drive), and Culverts C22/23 (Highway 401 EBL/WBL).	To be completed during Detail Design
Fish Passage	Fish passage to be maintained at locations of direct fish habitat where culvert replacement is proposed including Culverts C17 (Power Dam Drive) and C22/23 (Highway 401 EBL/WBL).	To be completed during Detail Design
Significant Fish Habitat	None identified within study area	N/A
Constraints and Opportunities	Watercress observed surrounding C17 – indicates potential groundwater inputs. Maintain or improve riparian vegetation where possible, adjacent to direct fish habitat (i.e., Culverts C17, and C22/23)	To be completed during Detail Design
Other considerations	None identified within study area	N/A

6. POTENTIAL ENHANCEMENT/OFFSETTING MEASURES

The proposed interchange under G.W.P. 4092-19-00 and associated culvert/drainage works are anticipated to result in minor changes to the existing ecological footprint within confirmed fish habitat. Through field surveys, in conjunction with a review of potential impacts based on the preferred alternative Preliminary Design, no major opportunities for fish habitat enhancement measures to existing features were identified.

While no major enhancement opportunities exist given the site conditions present throughout the study area, which include previously disturbed/altered watercourse features, the following should be considered to improve conditions within the study area.

- Ensure culvert replacements are designed/constructed in a manner to maintain or enhance fish passage to upstream areas including appropriate sizing and embedment with the elimination of any existing culvert perches.
- Stabilize highway embankments to minimize future erosion and washout of granular material from entering fish habitat.
- Where possible, consider the incorporation of riparian plantings using native species common to the area to increase vegetative cover and stabilize exposed soils within disturbed areas. This can be done using native seed mixtures and/or potted plants.

Although a final detailed impact assessment is required during Detail Design, the preliminary review of potential impacts indicates a low severity of negative effects to fish and fish habitat due to the alteration/loss of existing low sensitivity habitats that is anticipated to result from the drainage modifications and culvert replacements at C17 and C22/23. Based on the high-level review of significance of this residual effect, the intensity and spatial scale are likely to be low due to the existing low sensitivity fish habitat coupled with the minor area of permanent impact through alteration/destruction (i.e., <30 m²). Given the low intensity and spatial scale, it is anticipated that submission of a Request for Review application form to DFO will likely not be required during Detail Design. However, this will require confirmation through the Aquatic Effects Assessment process using DFO Pathways of Effects (PoE) diagrams by a qualified Fisheries Assessment Specialist.

7. CONCLUSION AND RECOMMENDED NEXT STEPS

In fulfillment of the Work Order for Assignment #4 under MTO Agreement 4019-E-0023, MH completed the fish and fish habitat existing conditions investigations and preliminary review of potential impacts to support the Preliminary Design and EA of the proposed interchange at Highway 401 and Power Dam Drive. A total of twenty-six existing culverts were assessed using results from the field investigations and background information, and it was determined that six of the culverts supported direct fish habitat, including four separate watercourses (i.e., unnamed tributaries of South Raisin River). The tributaries that supported fish habitat were confirmed to be warmwater systems with permanent flow regimes, and the fish community present included common bait/forage fish species. There were no sensitive or significant fish or fish habitat features present, such as important spawning areas or aquatic SAR/SAR habitat. All habitats have been previously altered through channelization and/or roadway construction and experience ongoing degradation through pollution from highway runoff and litter as well as Highway ROW maintenance.

Using the preferred alternative Preliminary Design, a review of potential impacts was completed for the proposed interchange. The primary impacts to fish habitat that are anticipated to result include both habitat alteration and minor destruction from the culvert replacements with extensions at C22/23 along the unnamed tributary of South Raisin River. Although a wide range of mitigation measures as identified in standard provincial and MTO specifications are anticipated to be applicable to protect fish and fish habitat during construction, residual effects of low severity are expected to persist from the proposed culvert extensions at C22/23. A precursory analysis of residual effects indicates that the approximate scale/extent of impact below the high-water mark will be between 25-30 m² of permanent alteration from the culvert extensions with a small portion of this (5-10 m²) being permanent destruction below the high-water mark. Given the impact will occur within low sensitivity habitat, the scale/extent of potential residual effect is considered low and is not anticipated to result in causing HADD of fish habitat. Therefore, based on this preliminary review of potential impacts, it is currently unlikely that a Request for Review Application Form would be warranted during Detail Design assuming that the extent of impact remains similar.

In accordance with the *MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings* (Version 4, 2020), the information provided within this report shall be used to support the fisheries assessment process outlined within Step 4 during Detail Design. A thorough impact assessment and analysis of the severity of negative residual effects is required to develop a final determination whether the project is likely to cause death of fish and/or HADD of fish habitat, as defined by the *Fisheries Act*. This shall be accomplished through completing a detailed Aquatic Effects Assessment as per the *MTO Interim Environmental Guide for Fisheries* (Version 3.0, 2020) and documented within a Fish and Fish Habitat Impact Assessment Report. During Detail Design, the qualified Fisheries Assessment Specialist shall identify whether the project can proceed under the MTO Project Notification Form process or if DFO review is required through the Request for Review Application Form process.

8. CLOSURE

We trust the information presented in this report meets your requirements. If you have any further questions or need additional details, please do not hesitate to contact our office.

Morrison Hershfield Limited.

Prepared by:



Dave Wood, B.Sc., CAN-CISEC
Fisheries Biologist
Fisheries Assessment Specialist
dwood@morrisonhershfield.com
613 739 2910 Ext. 1022259

Reviewed by:



Tom Howson, B.Sc., CAN-CISEC
Fisheries Biologist / Ecology Team Lead
Fisheries Assessment Specialist
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9. REFERENCES

Barnes, P. Personal Communications. June 2022. Team Lead, Watershed Management, Raisin Region Conservation Authority – Kemptville District.

Google Earth Pro. Imagery Date: 9/7/2018. Accessed at <https://www.google.com/earth/download/gep/agree.html?hl=en-GB>.

Government of Canada. 2023. Fisheries and Oceans Canada. Aquatic Species at Risk Maps. Accessed at <https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html>.

Land Information Ontario. 2023. Aquatic Resources Area Line Segment. Accessed at <https://geohub.lio.gov.on.ca/datasets/aquatic-resource-area-line-segment/explore?location=45.226150%2C-75.749027%2C13.96>.

Land Information Ontario. 2013. Aquatic Resources Area Polygon Segment. Accessed at <https://geohub.lio.gov.on.ca/datasets/0558f6ccea08410790a9182e568195c0/explore?location=45.224883%2C-75.747348%2C13.13>.

Land Information Ontario. 2023. Aquatic Resources Area Survey Point. Accessed at <https://geohub.lio.gov.on.ca/datasets/lio::aquatic-resource-area-survey-point/explore?location=45.225443%2C-75.748313%2C12.99>.

Land Information Ontario. 2023. Fish Activity Area. Accessed at <https://geohub.lio.gov.on.ca/datasets/lio::fish-activity-area/explore?location=45.224546%2C-75.747878%2C14.01>.

Ontario Ministry of Natural Resources and Forestry. 2022. Fish ON-Line. Accessed at <https://www.lioapplications.lrc.gov.on.ca/fishonline/Index.html?viewer=FishONLine.FishONLine&locale=en-CA>.

Ontario Ministry of Natural Resources and Forestry. 2022. Make a Natural Heritage Map <https://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map>.

Ontario Ministry of Transportation. 2013. Environmental Reference for Highway Design.

Ontario Ministry of Transportation. 2020. Interim Environmental Guide for Fisheries.

Ontario Ministry of Transportation. 2020. MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings – Pilot (Version 4).

Smithers, S. Personal Communications. June 2022. Management Biologist, Ministry of Natural Resources and Forestry – Kemptville District.

APPENDIX A: Correspondence with Regulatory Agencies

Ami Arsenault

From: Ami Arsenault
Sent: Tuesday, April 19, 2022 1:07 PM
To: info@rrca.on.ca
Cc: Dave Wood; Chantal Robillard
Subject: MTO - Power Dam Road - Information Request
Attachments: Assignment #4 - Project Location Map.kmz; Assignment #4 - Project Location.jpg

To whom it concerns,

Morrison Hershfield Limited (MH) has been retained by the Ontario Ministry of Transportation (MTO) Eastern Region to prepare the Preliminary Design and complete a Class Environmental Assessment (EA) Study for the conceptual design of a bridge which carries Power Dam Drive over Highway 401 including interchange modifications, falling within the jurisdiction of the Raisin River Conservation Authority (RRCA) – please refer to attached location maps. This project will include fisheries and terrestrial field investigations regarding surrounding natural areas that may be impacted by the proposed project. As such, we would like to request any fish community/fish habitat, terrestrial and/or Species at Risk information that RVCA has available for the project location to assist MH in the documentation of natural environment existing conditions and potential constraints to the project.

Should you have any questions or comments regarding this request, please feel free to contact me directly.

Thank you,

Ami

Ami Arsenault, Dipl., ISA Certified Arborist

Ecology Team, Intermediate Terrestrial Biologist

aarsenault@morrisonhershfield.com

Tel: 613-739-2910 x1022250 | Cell: 343-574-8711



200-2932 Baseline Road | Ottawa, ON K2H 1B1 Canada
morrisonhershfield.com

Ami Arsenault

From: Phil Barnes <phil.barnes@rrca.on.ca>
Sent: Monday, June 20, 2022 3:44 PM
To: Ami Arsenault; RRCA Reception
Cc: Dave Wood; Chantal Robillard
Subject: RE: MTO - Power Dam Road - Information Request
Attachments: PowerDamOnRampHazards.pdf; PowerDamOnRampHeritage.pdf

Good afternoon,

At this location, we do not have any additional information that can not be located from various online data sources. I have prepared two maps, one that shows the natural heritage features (wetlands, woodlands, ANSI, and possible species at risk), and a map that shows the natural hazards (or lack of mapped natural hazard features).

There are two watercourses near the site, the one to the South has no known classification, and the one to the east is listed as Class E.

I can confirm there are no Source Water Protection Intake Protection Zones or Wellhead Protection Areas on site or adjacent to the site.

Sincerely,
Phil Barnes

Phil Barnes, P.Eng.
Team Lead, Watershed Management
Raisin Region Conservation Authority
613-938-3611 x 240 www.rrca.on.ca

From: Ami Arsenault <AArsenault@morrisonhershfield.com>
Sent: June 15, 2022 5:51 PM
To: RRCA Reception <info@rrca.on.ca>
Cc: Dave Wood <DWood@morrisonhershfield.com>; Chantal Robillard <CRobillard@morrisonhershfield.com>; Phil Barnes <phil.barnes@rrca.on.ca>
Subject: RE: MTO - Power Dam Road - Information Request

Good afternoon Phil,

I am following up on the information request below regarding the modifications of the bridge/overpass at the intersection of Highway 401 and Power Dam Road (i.e., Assignment 4) that was originally submitted on **April 19, 2022** (see email below). I have reattached the documents that were included with the initial info request email.

If you can kindly provide an update on the status of the information request that would be greatly appreciated.

Should you have any questions, don't hesitate to contact me directly.

Regards,

Ami

From: RRCA Reception <info@rrca.on.ca>

Sent: Tuesday, April 19, 2022 5:32 PM

To: Ami Arsenault <AArsenault@morrisonhershfield.com>

Cc: Dave Wood <DWood@morrisonhershfield.com>; Chantal Robillard <CRobillard@morrisonhershfield.com>; Phil Barnes <phil.barnes@rrca.on.ca>

Subject: FW: MTO - Power Dam Road - Information Request

Good afternoon Ami,

Thank you for contacting us. I am forwarding your request to Phil Barnes, RRCA Watershed Management Team Lead (cc'd).

Regards,

Vincent Pilon

Public Information Coordinator

Raisin Region Conservation Authority

613-938-3611 | www.rrca.on.ca

From: Ami Arsenault <AArsenault@morrisonhershfield.com>

Sent: April 19, 2022 1:07 PM

To: RRCA Reception <info@rrca.on.ca>

Cc: Dave Wood <DWood@morrisonhershfield.com>; Chantal Robillard <CRobillard@morrisonhershfield.com>

Subject: MTO - Power Dam Road - Information Request

To whom it concerns,

Morrison Hershfield Limited (MH) has been retained by the Ontario Ministry of Transportation (MTO) Eastern Region to prepare the Preliminary Design and complete a Class Environmental Assessment (EA) Study for the conceptual design of a bridge which carries Power Dam Drive over Highway 401 including interchange modifications, falling within the jurisdiction of the Raisin River Conservation Authority (RRCA) – please refer to attached location maps. This project will include fisheries and terrestrial field investigations regarding surrounding natural areas that may be impacted by the proposed project. As such, we would like to request any fish community/fish habitat, terrestrial and/or Species at Risk information that RRCA has available for the project location to assist MH in the documentation of natural environment existing conditions and potential constraints to the project.

Should you have any questions or comments regarding this request, please feel free to contact me directly.

Thank you,

Ami

Ami Arsenault, Dipl., ISA Certified Arborist

Ecology Team, Intermediate Terrestrial Biologist

aarsenault@morrisonhershfield.com

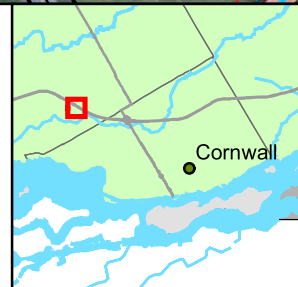
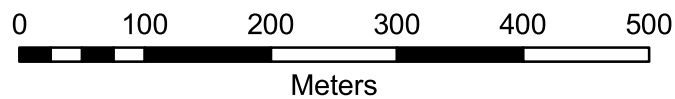
Tel: 613-739-2910 x1022250 | Cell: 343-574-8711



Map 2: Natural Hazards



- Selected Parcel
- Organics - Muck Soil
- Watercourse
- 15m Water Setback
- Floodplain
- Floodplain 15m Setback

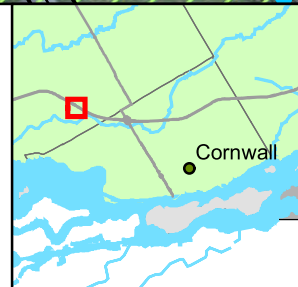
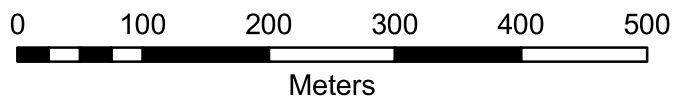


Raisin Region
Conservation Authority

Map 3: Natural Heritage



- | | |
|-----------------|------------------------|
| Selected Parcel | Wetlands |
| Watercourse | Evaluated-Provincial |
| ANSI | Evaluated-Other |
| NHIC Data | Not evaluated per OWES |
| | Significant Woodlands |



Raisin Region
Conservation Authority

Ministry of Transportation
NDMNRF Information Request

December 16, 2021

Ministry of Northern Development, Mines, Natural Resources and Forestry
Unit 1, 10 Campus Drive,
Kemptville, ON K0G 1J0

Re: Data Request for Fisheries and Natural Heritage Information – Kemptville District, Ontario

Attention: Kemptville District (NDMNRF)

In accordance with the *MTO/DFO/NDMNRF Protocol for Protecting Fish and Fish Habitat on Provincial Highway Undertakings - Version 4, 2020* (the Protocol), this letter is to request background data for Fisheries, and Significant Natural Heritage Features from the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) for the following Ministry of Transportation (MTO) undertaking of:

- **Agreement #4019-E-0023: Assignment #4** – Proposed work associated with this MTO Assignment includes the Detail Design for the Replacement of an overpass bridge (Site 13-180) that carries Power Dam Drive over Highway 401 in the Municipality of South Stormont. The scope of the assignment includes fisheries, terrestrial, and SAR field investigations to support the proposed works.

Morrison Hershfield Limited (MH) has been retained by the MTO to conduct spring and summer field investigations under the Protocol for this project. MH fisheries biologists have reviewed existing online background information that was made available through desktop aquatic resource data (i.e., Fish ON-line and Land Information Ontario LIO) and the results are provided in **bold italics** within the attached **Table 1**. One defined watercourse, South Raisin River, was identified within the immediate vicinity of the project area. Additionally, three unnamed tributaries of South Raisin River are conveyed beneath Highway 401 within the project limits. We request that the NDMNRF reviews **Table 1** in order to confirm and update the information regarding aquatic features identified within the study area as well as any other aquatic values located within the project limits.

MH would also like to request any available terrestrial and/or natural heritage feature(s) data for the project location at Highway 401 and Power Dam Drive, as well as the adjacent lands which have the potential to be impacted by the proposed undertaking such as Provincially Significant Wetlands (PSW's), Significant Woodlots, wildlife concentration areas, etc. MH terrestrial biologists have reviewed background information pertaining to terrestrial values surrounding the study area through accessing online resources including LIO, and Natural Heritage Information Centre (NHIC). The results of this desktop review are provided in **bold italics** within the attached **Table 2**. We request that the NDMNRF reviews **Table 2** in order to confirm and update the information regarding non-SAR terrestrial species/habitat present as well as any other significant natural heritage features (i.e., PSW's) within the study area.

We look forward to a response from NDMNRF within **30 working days**, as specified in the Protocol.

Thank you,



Dave Wood
Fisheries Biologist
DWood@morrisonhershfield.com

Table 1: Fish and fish habitat information for the intersection of Highway 401 and Power Dam Drive

Location of Work (GPS coordinates & Google Earth map)	Watercourse classification (i.e. warmwater, coldwater)	Habitat information/ locations (fish passage barriers, known spawning habitats, groundwater upwellings, migratory corridors etc.)	Historical data on fish species present, including whether the subject waterbody(s) [SPECIFY LOCATION] are considered to support any vulnerable, threatened or endangered aquatic species	NDMNRF fisheries management objectives, if applicable	In-water timing windows for construction
South Raisin River approximately 600 m southeast of Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N) See <i>project location map</i>	Warm	Unknown	<u>LIO ARA Layer:</u> Banded Killifish, Blacknose Shiner, Bluntnose Minnow, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fantail Darter, Fathead Minnow, Golden Shiner, Iowa Darter, Johnny Darter, Johnny Darter x Tesselated Darter, Largemouth Bass, Logperch, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, Round Goby, Spotfin Shiner, Sunfishes, Tadpole Madtom, White Sucker, Yellow Perch <u>Fish ON-Line:</u> Brown Bullhead, Common Carp, Largemouth Bass, Northern Pike, Pumpkinseed, Rock Bass,	Unknown	July 1 - Dec 31

Ministry of Transportation
NDMNRF Information Request

			<i>White Sucker, Yellow Perch, Walleye, Burbot</i> <u>NHIC:</u> No Data <u>DFO SAR Map:</u> No Data		
Unnamed tributary (1) of South Raisin River approximately 900 m northwest of Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N) See <i>project location map</i>	Unknown	Warm	<u>LIO ARA Layer:</u> Brook Stickleback, Creek Chub, Northern Redbelly Dace <u>NHIC:</u> No Data <u>DFO SAR Map:</u> No Data	Unknown	March 15 – June 30
Unnamed tributary (2) of South Raisin River approximately 1 km southeast of Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N) See <i>project location map</i>	Unknown	Warm	Unknown	Unknown	March 15 – June 30
Unnamed tributary (3) of South Raisin River approximately 90 m west of Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N)	Unknown	Warm	Unknown	Unknown	March 15 – June 30

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See <i>project location map</i>					
Row for updated information from NDMNRF					

Table 2: Terrestrial data available from online resources for the intersection of Highway 401 and Power Dam Drive.

Location of Work (GPS coordinates & Google Earth map)	Land Information Ontario (LIO)	Natural Heritage Information Centre (NHIC).
Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N) including surrounding lands (see project location map).	No information available	No information available
Row for updated information from NDMNRF		

NOTE:

- NDMNRF is required as per Step 2 of the Fisheries Protocol to provide the applicant with the information outlined in the above table within **30 working days**.

Ami Arsenault

From: Andrew Ritchie
Sent: Wednesday, March 2, 2022 8:38 AM
To: Baczyk, Steve (MTO); Anabtawi, Abdallah (MTO)
Cc: Brad Hewton; Zach Hupman; Dylan McEvoy; Brian Dawod; Ami Arsenault; Tom Howson; Dave Wood
Subject: RE: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Good day Steve,

Thanks for the information, much appreciated. I have copied our Terrestrial/Aquatic Specialists who will review and confirm that all is in order.

Thanks again for your efforts and have a great day.

Andrew

Andrew Ritchie, M.Pl., MCIP, RPP
Senior Environmental Planner
aritchie@morrisonhershfield.com



Suite 175, 1005 Skyview Drive | Burlington, ON L7P 5B1
Dir: 289 266 1918 | Toll Free: 1 (888) 649-4730 | Fax: 905 319 5548
morrisonhershfield.com

From: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>
Sent: February 28, 2022 12:39 PM
To: Andrew Ritchie <ARitchie@morrisonhershfield.com>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>
Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>
Subject: RE: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Hi Andrew,

Sorry for the delayed response, but I needed to consult with the Policy office and other planners to ensure that we, Environmental Planners, are able to provide SAR data, and what we provide is consistent with the ministry approach across the province.

Based on those discussions, I have reviewed the NHIC list that was provided below by MH and my review confirmed the presence of species that MH has identified. The additional species that I noted are provided below within the table. Unfortunately, I cannot confirm the presence of any species provided below based on the information from the Bird, Reptile/Amphibian or Butterfly atlases as we don't have access to those databases.

Please note, we have been advised that any sensitive or restricted data should only be provided if there is a specific request for it and there is a clear, defined need so it would not be provided at this time.

<u>Project Location</u>	<u>Aquatic SAR Information</u>	<u>Terrestrial SAR Information</u>
Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N)	No Aquatic SAR Identified	Natural Heritage Information Centre – (Data Squares 18WQ1388, 18WQ1389, 18WQ1490, 18WQ1489, 18WQ1588, 18WQ1589): Bobolink, Wood Thrush, Eastern Meadowlark Ontario Breeding Bird Atlas (Data Square 18TWQ18): Barn Swallow, Bobolink, Eastern Meadowlark, Eastern Wood Pewee, Wood Thrush Ontario Reptile & Amphibian Atlas (Data Square 18WQ18): Blanding’s Turtle, Eastern Musk Turtle, Midland Painted Turtle, Northern Map Turtle, Snapping Turtle Ontario Butterfly Atlas (Data Square 18WQ18): Monarch
MTO SAR Data Update	ADDITIONAL SPECIES: Cutlip Minnow	NHIC Data Squares: 18WQ1388, 18WQ1389, 18WQ1490, 18WQ1489, 18WQ1588, 18WQ1589: Bobolink – <i>confirmed</i> Wood Thrush – <i>confirmed</i> Eastern Meadowlark – <i>confirmed</i> ADDITIONAL SPECIES: - Snapping Turtle - Least Bittern

If you have any questions about this information or wish to discuss it further please let me know. Again, my apologies for the delay!

Thanks,
Steve

Steve Baczyk | Environmental Planner
Ministry of Transportation | Environmental Delivery East
1355 John Counter Boulevard | Kingston | Ontario | K7L 5A3
☎ Cell 613-539-5280 | ✉ steve.baczyk@ontario.ca

From: Andrew Ritchie <ARitchie@morrisonhershfield.com>

Sent: February 10, 2022 2:13 PM

To: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>

Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>

Subject: Re: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request
Importance: High

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good day Steve,

Understood and appreciated. Please keep us apprised as things progress.

Best regards,

Andrew

Andrew Ritchie, M.P.I., MCIP, RPP

Senior Environmental Planner

aritchie@morrisonhershfield.com



Suite 175, 1005 Skyview Drive | Burlington, ON L7P 5B1

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From: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>

Sent: February 9, 2022 12:31 PM

To: Andrew Ritchie <ARitchie@morrisonhershfield.com>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>

Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>

Subject: RE: Re: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Hi Andrew,

Sorry for a delayed response, but I am working through the MTO application process to obtain access to the MNRF restricted SAR database. I am hoping to get this access very soon and will reply to your request as soon as I can.

Thanks,

Steve

Steve Baczyk | Environmental Planner

Ministry of Transportation | Environmental Delivery East

1355 John Counter Boulevard | Kingston | Ontario | K7L 5A3

☎ Cell 613-539-5280 | ✉ steve.baczyk@ontario.ca

From: Andrew Ritchie <ARitchie@morrisonhershfield.com>

Sent: February 8, 2022 3:16 PM

To: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>

Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>

Subject: RE: Re: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request

Importance: High

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Good day Steve,

Hopefully this email finds you and yours well. I am following up on my email below.

Could you please advise of the status of our request for terrestrial/aquatic SAR and SAR habitat occurrence data from MTO. We are looking to compile all available secondary data to prepare our initial Exiting Conditions reports to complete the evaluation of alternatives.

Thanks, and much appreciated.

Andrew

Andrew Ritchie, M.P.I., MCIP, RPP
Senior Environmental Planner
aritchie@morrisonhershfield.com



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morrisonhershfield.com

From: Andrew Ritchie
Sent: January 14, 2022 4:13 PM
To: Baczyk, Steve (MTO) <Steve.Baczyk@ontario.ca>; Anabtawi, Abdallah (MTO) <Abdallah.Anabtawi@ontario.ca>
Cc: Brad Hewton <BHewton@morrisonhershfield.com>; Zach Hupman <ZHupman@morrisonhershfield.com>
Subject: Re: (MH-2019794-04) - MTO Highway 401 Power Dam Drive - Assignment #4 - SAR Information Request
Importance: High

Good day Steve,

A belated Happy New Year to you and yours. It is our understanding that the Ministry of Transportation (MTO) is now able to access the provincial Species at Risk (SAR) database for species/habitat protected under the *Endangered Species Act* (ESA). Morrison Hershfield (MH) would like to request terrestrial/aquatic SAR and SAR habitat occurrence data from MTO for the following project:

- **Agreement #4019-E-0023: Assignment #4** – Proposed work associated with this MTO Assignment includes Preliminary Design for the replacement of an overpass bridge (Site 13-180) that carries Power Dam Drive over Highway 401 in the Municipality of South Stormont. The scope of the assignment includes fisheries, terrestrial, and SAR field investigations to support the proposed works.

Please refer to the attached map and KMZ file which outline the project location along Highway 401. Information regarding SAR within the project area which was gathered by MH from online resources has been compiled within the table below. We request that MTO confirms and/or updates this information as necessary.

<u>Project Location</u>	<u>Aquatic SAR Information</u>	<u>Terrestrial SAR Information</u>
Highway 401 and Power Dam Drive Intersection (18T 515050E, 4989522N)	No Aquatic SAR Identified	Natural Heritage Information Centre – (Data Squares 18WQ1388, 18WQ1389, 18WQ1490, 18WQ1489, 18WQ1588, 18WQ1589): Bobolink, Wood Thrush, Eastern Meadowlark

		Ontario Breeding Bird Atlas (Data Square 18TWQ18): Barn Swallow, Bobolink, Eastern Meadowlark, Eastern Wood Pewee, Wood Thrush Ontario Reptile & Amphibian Atlas (Data Square 18WQ18): Blanding's Turtle, Eastern Musk Turtle, Midland Painted Turtle, Northern Map Turtle, Snapping Turtle Ontario Butterfly Atlas (Data Square 18WQ18): Monarch
MTO SAR Data Update		

Please note that our Team has also submitted a similar request to the NDMNRF Kemptville District Office. Please acknowledge receipt and let us know if you have any questions about this request.

Thanks for your efforts, and best regards,

Andrew

Andrew Ritchie, M.Pl., MCIP, RPP

Senior Environmental Planner

aritchie@morrisonhershfield.com



Suite 175, 1005 Skyview Drive | Burlington, ON L7P 5B1

Dir: 289 266 1918 | Toll Free: 1 (888) 649-4730 | Fax: 905 319 5548

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APPENDIX B: Aquatic Photographic Record



Photo 1. Culvert 2 (C2) – Highway 401 – Overview of the culvert inlet and upstream channel. April 11, 2022



Photo 2. C2 – Highway 401 – View of the culvert inlet and upstream channel flowing to culvert. April 11, 2022



Photo 3. C2 – Highway 401 – View of the channel upstream of the culvert inlet. April 11, 2022



Photo 4. C2 – Highway 401 – View inside culvert inlet from upstream side. April 11, 2022



Photo 5. C2 – Highway 401 – Overview of the culvert outlet and downstream channel. April 11, 2022



Photo 6. C2 – Highway 401 – View of the downstream channel looking at the culvert outlet. April 11, 2022



Photo 7. C2 – Highway 401 – Close up view of the downstream channel after culvert outlet. April 11, 2022



Photo 8. C2 – Highway 401 – View of downstream channel flowing through agricultural field. April 11, 2022



Photo 9. C2 – Highway 401 – View of a Central Mudminnow captured in spring at culvert C2. April 11, 2022



Photo 10. C2 – Highway 401 – View of a Creek Chub captured in spring at culvert C2. April 11, 2022



Photo 11. C2 – Highway 401 – Overview of the culvert outlet and downstream channel during summer. June 29, 2022



Photo 12. C2 – Highway 401 – View of the downstream channel at culvert outlet during summer. June 29, 2022



Photo 13. Culvert 17 (C17) – Power Dam Drive – Overview of the culvert inlet and upstream channel. April 11, 2022



Photo 14. C17 – Power Dam Drive – View of the culvert inlet. April 11, 2022



Photo 15. C17 – Power Dam Drive – Overview of the culvert outlet and downstream channel. April 11, 2022



Photo 16. C17 – Power Dam Drive – View of the culvert outlet. April 11, 2022



Photo 17. C17 – Power Dam Drive – View of the downstream channel and downstream secondary culvert. April 11, 2022



Photo 18. C17 – Power Dam Drive – View of a Common Shiner captured during spring. April 11, 2022



Photo 19. C17 – Power Dam Drive – Overview of the culvert inlet and upstream channel during summer. June 29, 2022



Photo 20. C17 – Power Dam Drive – Overview of the culvert outlet and downstream channel during summer. June 29, 2022



Photo 21. Culvert 18 (C18) – Atchison Road – Overview of the culvert inlet and upstream channel. April 11, 2022



Photo 22. C18 – Atchison Road – View of the culvert inlet. April 11, 2022



Photo 23. C18 – Atchison Road – Close view of the channel upstream of the culvert inlet. April 11, 2022



Photo 24. C18 – Atchison Road – Overview of the culvert outlet and downstream channel. April 11, 2022



Photo 25. C18 – Atchison Road – View of the culvert outlet.
April 11, 2022



Photo 26. C18 – Atchison Road – Close view of the channel
downstream of the culvert outlet. April 11, 2022



Photo 27. C18 – Power Dam Drive – View of a Juvenile White
Sucker captured during spring. April 11, 2022



Photo 28. C18 – Power Dam Drive – View of a Central
Mudminnow captured during spring. April 11, 2022



Photo 29. Culvert 22 (C22) – Highway 401 – View of the outlet and downstream channel area. April 11, 2022



Photo 30. C22 – Highway 401 – View of the outlet with standing water. April 11, 2022



Photo 31. C22 – Highway 401 – View of the inundated ditch line and standing water near culvert outlet. April 11, 2022



Photo 32. C22 and C23 – Hwy 401 (Median) – View of the inlet (C22) and outlet (C23) at the median. April 11, 2022



Photo 33. Culvert 23 (C23) – Highway 401 – Overview of the culvert inlet and upstream channel. April 11, 2022



Photo 34. C23 – Highway 401 – View looking at the culvert inlet from upstream channel. April 11, 2022



Photo 35. C23 – Highway 401 – View of the upstream channel. April 11, 2022



Photo 36. C23 – Highway 401 – View of the upstream channel that flows parallel to agricultural field. April 11, 2022



Photo 37. Culvert 25 (C25) – Highway 401 – Overview of the culvert inlet and upstream channel area. April 11, 2022



Photo 38. C25 – Highway 401 – View of the upstream area and ditch line with standing water. April 11, 2022



Photo 39. C25 – Highway 401 – View of the culvert inlet with flooded ditchline. April 11, 2022



Photo 40. C25 – Highway 401 – View of the further upstream channel. April 11, 2022



Photo 41. C25 – Highway 401 – Overview of the culvert outlet and downstream area. April 11, 2022



Photo 42. C25 – Highway 401 – View of culvert outlet, downstream area and standing water in ditchline. April 11, 2022



Photo 43. C25 – Highway 401 – View of the downstream channel area. April 11, 2022



Photo 44. C25 – Highway 401 – View of a Brook Stickleback captured during spring. April 11, 2022

APPENDIX C: Field Data Collection Forms & Habitat Maps

Ministry of Transportation

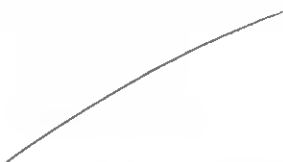
WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # <i>2019794-04</i>		Project Description: <i>HWY 401 / POWERDAM DR.</i>		Date: <i>APRIL 11, 2022.</i>
Is Stream Realignment required for this section: ☐ Yes ☐ No ☒ Unknown				
Collectors: <i>T. HOWSON / D. WOOD.</i>		Time Started: <i>10:00.</i>	Time Finished: <i>11:40</i>	
Weather Conditions:				
Air Temp (°C): <i>5°C</i>	Water Temp (°C): <i>4.2</i>	Conductivity (µS/cm): <i>472</i>	Velocity (m/s): _____	
Photos Numbers And Descriptions:				
LOCATION				
Name of Waterbody: <i>TRIB OF S. RAISIN RIVER,</i>		Drainage System: <i>RAISIN RIVER</i>	Crossing #: <i>C2.</i>	Station #: _____
Location Of Crossing:				
GPS Coordinates: <i>45,06316 74.81929.</i>			MTO Chainage: _____	
Township: <i>CORNWALL</i>			MNR District: <i>KEMPTVILLE.</i>	
LAND USE AND POLLUTION				
Surrounding Land Use: <i>AGRICULTURE, HWY 401, RURAL RES</i>		Sources of Pollution: <i>RUNOFF, LITTER.</i>		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☒	Open Foot Culvert ☒	CSP ☐	N/A ☐
Other ☐ (Describe) _____		Size: (w x h) m ²		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: <i>UPSTREAM.</i>			Section Location: (Include On Habitat Map) <i>NORTH OF HWY.</i>	
Associated Wetland				
Stream / River ☐	Channelized ☐	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): <i>25 m.</i>				

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Sub-Sections:		Run Ø	Pool Ø	Riffle ○	Flats ○	Culvert ○	Other ○
Percentage of Area:		90%	10%				
Mean wetted depth (m)		0.5m	0.6m				
Mean wetted width (m)		0.9m	1.1m				
Mean bankfull depth (m)		0.7m	0.8m				
Mean bankfull width (m)		3.0m	3.2m				
Substrate (type & %)		Bo, Co, GR, Sa, Si, D		Co, GR, Sa, Si, D			
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)
							Detritus (D)
BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Bank	○	Ø	○	○			
Right Bank	○	Ø	○	○			
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank			
Left Bank	○	○	Ø	○			
Right Bank	Ø	○	○	○			
HABITAT							
In-Stream Cover (% surface area):							
Undercut banks: 20%	Boulders: 5%	Cobbles: 5%	Organic Debris: 15%	None Ø 30%			
Vascular Macrophytes:				Woody Debris:			
Instream:				Instream:			
Overhanging: 20%				Overhanging: 5%			

Ministry of Transportation

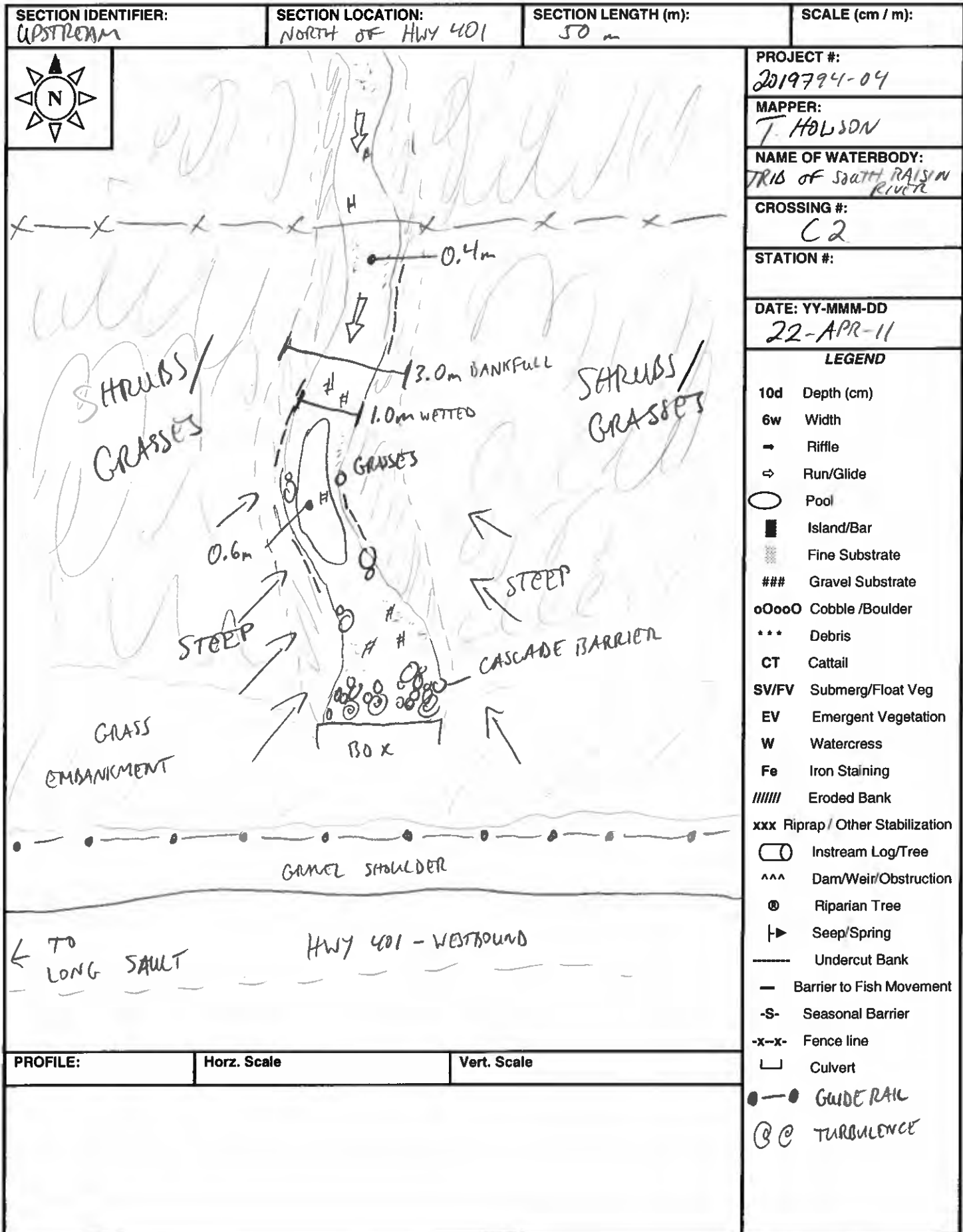
Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☒	None ☐
Vegetation Type:				
Vegetation Type (%)	Submergent: <i>NONE,</i>	Floating: <i>NONE,</i>	Emergent: <i>10</i>	None ☒
Predominant Species:			<i>GRASSES, FORBES</i>	<i>90%</i>
MIGRATORY OBSTRUCTIONS				
Permanent <i>CASCADE AT INLET 0.35 - .4m DROP</i>	Seasonal 		None 	
POTENTIAL CRITICAL HABITAT				
Spawning 	Groundwater <i>NO EVIDENCE,</i>		Other 	
POTENTIAL ENHANCEMENT OPPORTUNITIES				
<i>POTENTIALLY REMOVE BARRIER AT INLET</i>				

ADDITIONAL COMMENTS

- WELL DEFINED CHANNEL WITH UNDERCUT BANKS. - NILE RIPARIAN COMMUNITY UPSTREAM OF ROW - SHRUBS, GRASSES/MEADOW AND JUV TREES.
- CHANNEL MOSTLY RUNS WITH 1 POOL ~ 10 M. UIS OF CULVERT.
- NO CHANNEL VEG - OVERHANGING ONLY - BANK UNDERCUTTING.
- NO FISH CAUGHT.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____



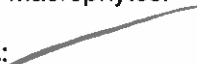
Ministry of Transportation

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 2019794-04		Project Description: HWY 401 / POWERDAM DR.		Date: APRIL 11, 2022
Is Stream Realignment required for this section: ☐ Yes ☐ No ☒ Unknown				
Collectors: T. HOWSON / D. WOOD.		Time Started: 10:00	Time Finished: 11:40	
Weather Conditions: CLEAR, LIGHT BREEZE.				
Air Temp (°C): 5°C	Water Temp (°C): 4.2	Conductivity (µS/cm): 472	Velocity (m/s): +	
Photos Numbers And Descriptions:				
LOCATION				
Name of Waterbody: TRIO OF S. RAISIN RIVER		Drainage System: RAISIN RIVER.	Crossing #: —	Station #:
Location Of Crossing: WEST OF POWERDAM DRIVE.				
GPS Coordinates: 45.06316 74.81929		MTO Chainage: —		
Township: CORNWALL.		MNR District: KEMPTVILLE.		
LAND USE AND POLLUTION				
Surrounding Land Use: AGRICULTURE, HWY 401.		Sources of Pollution: RUNOFF, LITTER.		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☒	Open Foot Culvert ☒	CSP ☐	N/A ☐
Other ☐ (Describe) —		Size: (w x h) m² UNKNOWN.		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: DOWNSTREAM		Section Location: (Include On Habitat Map) SOUTH OF HWY 401.		
Associated Wetland				
Stream / River ☐	Channelized ☐	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): 20-30m.				

Sub-Sections:		Run ○	Pool Ø	Riffle ○	Flats ○	Culvert ○	Other Ø	
Percentage of Area:		85%	10%				5%	
Mean wetted depth (m)		0.18	0.5				0.2 m	
Mean wetted width (m)		1.5	2.4 m				1.4 m	
Mean bankfull depth (m)		1.1 m	1.35 m				1 m	
Mean bankfull width (m)		2.5	3.2				2.2 m	
Substrate (type & %)		Cl, Bo, Co, GR, SI	Cl, Bo, Co, GR, SI				Cl, Bo, Co, GR, SI	
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)
	10%	20%	10%		10%	50%		

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	○	○	Ø	○
Right Bank	○	Ø	○	○
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	○	○	Ø	○
Right Bank	○	○	Ø	○

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks: 25%	Boulders: 10%	Cobbles: 10%	Organic Debris: 5%	None Ø 30
Vascular Macrophytes: Instream:  Overhanging: 15%			Woody Debris: Instream: 5% Overhanging: 	

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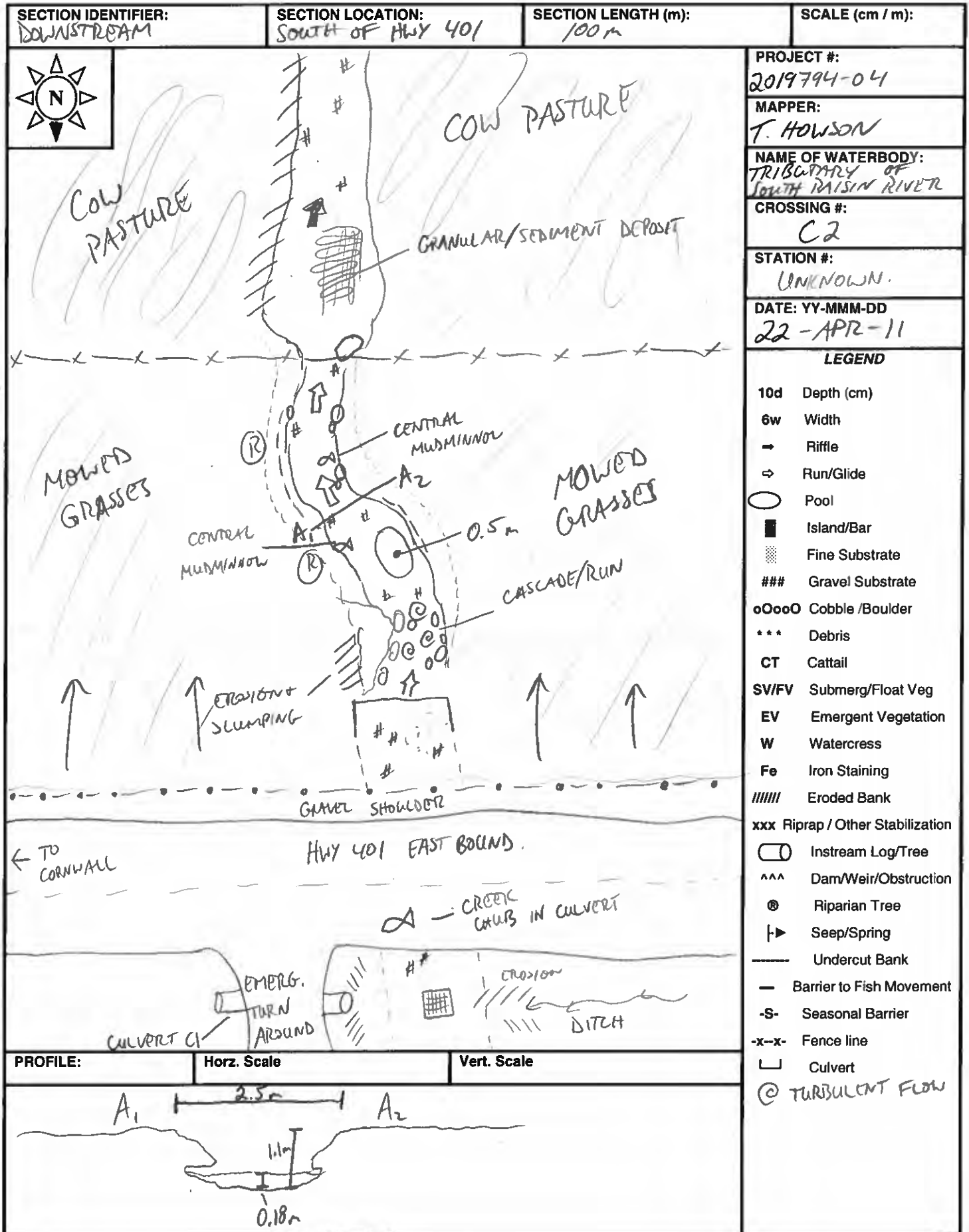
Shore Cover (% stream shaded):				
100-90% ○	89-60% ○	59-30% ○	29-1% ☒	None ○
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None Ø
			5%	95%
Predominant Species:			OVERHANGING 6 BASS ONLY	
MIGRATORY OBSTRUCTIONS				
Permanent	Seasonal		None	
NONE D/S.				
POTENTIAL CRITICAL HABITAT				
Spawning	Groundwater		Other	
	NO EVIDENCE.			
POTENTIAL ENHANCEMENT OPPORTUNITIES				
- STABILIZE HWY TURNAROUND IN MEDIAN. - GRANULAR MATERIAL IS ERODING INTO CATCH BASIN AND ENDING UP IN CULVERT.				

ADDITIONAL COMMENTS

- SWIFT RUN TO POOL TO CONTINUOUS RUN.
- WELL DEFINED CHANNEL WITH MAJOR BANK UNDERCUTS.
- SUBSTRATE DOMINATED BY CLAY.
- GRASSES / FORBES / SPARSE DEC TREES IN MTO ROW.
- DIS PROPERTY IS 100% PASTURAL - WIDE OPEN ± NO RIPARIAN.
- BANK SLUMPING / EROSION EVIDENT THROUGHOUT.
- C. MUDMINNOW / C. CHUB CAPTURED.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____



Note: circle number if a sample was kept

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FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION						
Project # 2019794-04		Project Description: ASSIGN 4 - HWY 401/ POWER DAM RD			Date: APRIL 11, 2022	
Collectors: T. HOLSON / D. WOOD			Time Started: 10:00		Time Finished:	
Weather Conditions: SUNNY, CALM, 3°C			Surface Conditions (If Applicable):			
			Calm ☒	Rippled ☐	Wavy ☐	Rough ☐
LOCATION						
Name of Waterbody: TRIB OF SOUTH RAISIN RIVER			Crossing #: C2		Station #:	
Location Of Crossing/Station:						
GPS Coordinates:			MTO Chainage:			
Township:			MNR District: KEMPTVILLE			
SAMPLING LOCATIONS AND WATER CHEMISTRY						
Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream	20	3	8.25		4.2	472
Downstream	20					
Culvert/Hwy ROW	20					
Water Colour:						
Colourless ☐	Yellow/Brown ☒	Blue/Green ☐	Turbid ☐	Other ☐		
GEAR						
Electrofisher:						
Length (m): 60		Settings: 150 V / 40 Hz / 35 DC			Seconds:	
Nets and Traps:						
Minnow Trap: ☐ #		Dip Net ☐ #		Trap Net ☐ #		
Seine: ☐		Gill ☐		Other ☐ Specify:		
Hauls (#):		Period Of Time (24 Hour Clock):				
		Set Time:			Clear Time:	
Size of Net:						
Length (m):		Mesh Size:			Depth of Capture:	
		Smallest (cm):			Minimum (m):	
		Largest (cm):			Maximum (m):	

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WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 201979404 - ASSIGN 4		Project Description: HWY 401/POWER DAM		Date: JUNE 29, 2022
Is Stream Realignment required for this section: ☐ Yes ☐ No ☒ Unknown				
Collectors: T. HOWSON / D. WOOD		Time Started: 10:20	Time Finished: 12:10	
Weather Conditions:				
Air Temp (°C): 21	Water Temp (°C): 17.1 °C	Conductivity (µS/cm): 760	Velocity (m/s):	
Photos Numbers And Descriptions: D.O. 8.5 PH: 7.83				
LOCATION				
Name of Waterbody: UNAMMED TRIBUTARY	Drainage System: SOUTH RAISIN RIVER	Crossing #: C2	Station #:	
Location Of Crossing: ~ 950 m WEST OF POWER DAM DR.				
GPS Coordinates:		MTO Chainage:		
Township: CORNWALL		MNR District: KEMPTVILLE		
LAND USE AND POLLUTION				
Surrounding Land Use: HIGHWAY, NATURAL		Sources of Pollution: RUNOFF, LITTER.		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☐	Open Foot Culvert ☒	CSP ☐	N/A ☐
Other ☐ (Describe) CAST IN PLACE CONCRETE		Size: (w x h) m ²		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: UPSTREAM		Section Location: (Include On Habitat Map) NORTH OF HWY 401		
Associated Wetland				
Stream / River ☒	Channelized ☐	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): 20m (TO PROPERTY FENCE)				

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Sub-Sections:		Run ☒	Pool ☐	Riffle ☐	Flats ☐	Culvert ☒	CASCAD Other ☒	
Percentage of Area:		90						10
Mean wetted depth (m)		0.18				0.1		
Mean wetted width (m)		0.6				1.0		
Mean bankfull depth (m)		0.55						
Mean bankfull width (m)		1.0						
Substrate (type & %)		Co, Bo, Gr Si, Mu, D, Cl					Gr, Co, Bo Si, Mu, Cl	
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)
	5	5	10		10	40	20	10

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☒	☐	☐	☐
Right Bank	☒	☐	☐	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☐	☒	☐	☐
Right Bank	☐	☒	☐	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None ☒
	5	5	10	40
Vascular Macrophytes:			Woody Debris:	
Instream: 5			Instream:	
Overhanging: 35			Overhanging:	

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Shore Cover (% stream shaded):				
100-90% ○	89-60% ○	59-30% ☒	29-1% ○	None ○
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent: 20	None 0
Predominant Species:			SENSITIVE FERN CANADA ANEMONE GRASSES CATTAILS. FORBS. HORSETAIL. PARSNIP	80
MIGRATORY OBSTRUCTIONS				
Permanent	Seasonal CASCADE OVER BOULDER/ COBBLE AT INLET.		None	
POTENTIAL CRITICAL HABITAT				
Spawning LIKELY BAITFISH GIVEN CAPTURE OF 1/6Y / JUV CYPRINIDS	Groundwater NO EVIDENCE OBSERVED.		Other	
POTENTIAL ENHANCEMENT OPPORTUNITIES				
GRADE BARRIER AT INLET APPEARS NATURAL. - WOULD LIKELY REQUIRE CHANNEL MODIFICATIONS TO REMOVE / RE-GRADE.				

0.6m 1.5W 0.5W 1.4
RIFF - POOL - RIFF - FLATS
0.240 0.020 0.150 + 0.620 BF

ADDITIONAL COMMENTS

- CHANNEL COMPRISED OF CONTINUOUS RUN IN SUMMER WITH EXCEPTION OF CASCADE AT INLET.
- DENSE RIPARIAN VEGETATION OVERHANGING MAJORITY OF CHANNEL COMPRISED OF CATTAIL, GRASSES, FORBES, CATTAILS IN ROW.
- FLOW WAS MUCH LOWER THAN SPRING AS BANK UNDECUTS WERE EXPOSED/ DRY IN MOST AREAS.
- JUV / YG BAITFISH CAPTURED UPSTREAM WHICH APPEARED TO BE NORTHERN R.B. DACE, AS WELL AS BROOK STICKLEBACK.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

Ministry of Transportation

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 201979404 - ASSIGN#4		Project Description: HWY 401 / POWERDAM DR.		Date: JUNE 29, 2022
Is Stream Realignment required for this section: ☐ Yes ☐ No ☒ Unknown				
Collectors: T. HOWSON / D. WOOD.		Time Started: 10:20	Time Finished: 12:10.	
Weather Conditions: 40% CLOUD COVER - HUMID.				
Air Temp (°C): 21°C	Water Temp (°C): 17.1	Conductivity (µS/cm): 760	Velocity (m/s):	
Photos Numbers And Descriptions: D.O. 8.5 pH 7.53				
LOCATION				
Name of Waterbody: UNNAMED TRIBUTARY		Drainage System: S. RAISIN RIVER	Crossing #: C2	Station #:
Location Of Crossing: ~ 950 M WEST OF POWERDAM DRIVE.				
GPS Coordinates:		MTO Chainage:		
Township: CORNWALL		MNR District: KEMPTVILLE		
LAND USE AND POLLUTION				
Surrounding Land Use: HIGHWAY, AGRICULTURAL		Sources of Pollution: RUNOFF, LITTER, AGRICULTURE (LIVE STOCK)		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☐	Open Foot Culvert ☒	CSP ☐	N/A ☐
Other ☐ (Describe) CAST IN PLACE.		Size: (w x h) m ²		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: DOWNSTREAM		Section Location: (Include On Habitat Map)		
Associated Wetland NO.				
Stream / River ☒	Channelized ☐	Permanent ☐	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): ~ 15 - 20 M.				

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Sub-Sections:		Run ○	Pool ○	Riffle ○	Flats ○	Culvert ○	Other ○	
Percentage of Area:			10	20	70			
Mean wetted depth (m)			0.34	0.02	0.15			
Mean wetted width (m)			1.5m	0.56	1.4			
Mean bankfull depth (m)			1.3m	1.1m	1.3			
Mean bankfull width (m)			1.6m	1.5m	2.1			
Substrate (type & %)		Bo, Co, Gr, SA SI, CL, D		Bo, Co, Gr SA, SI, CL	SA, SI, MU, CL, D, GR.			
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)
BANK STABILITY								
LOOKING WS.	Stable	Slightly Unstable		Moderately Unstable		Unstable		
Left Bank	○	○		○		○		
Right Bank	○	○		○		○		
	Deposition Zone	Protected Bank		Vulnerable Bank		Eroding Bank		
Left Bank	○	○		○		○		
Right Bank	○	○		○		○		
HABITAT								
In-Stream Cover (% surface area):								
Undercut banks: 25	Boulders: 10	Cobbles: 10		Organic Debris: 5		None 30		
Vascular Macrophytes:					Woody Debris:			
Instream:					Instream: 5			
Overhanging: 15					Overhanging:			

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Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☒	None ☐
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent: 5%	None ☐
Predominant Species:			GRASSES / FORBES ALONG MARGINS.	95%
MIGRATORY OBSTRUCTIONS				
Permanent None.	Seasonal 		None 	
POTENTIAL CRITICAL HABITAT				
Spawning LIKELY BAITFISH	Groundwater NO EVIDENCE.		Other 	
POTENTIAL ENHANCEMENT OPPORTUNITIES				
- STABILIZE GRANULAR MATERIAL ERODING AT TURN-AROUND AS GRAVEL/FINES IS WASITING INTO CULVERT FROM MEDIAN CATCH BASIN.				

ADDITIONAL COMMENTS

- MORPH IN SUMMER INCLUDED A RIFFLE AT THE OUTLET WHICH TRANSITIONED TO POOL, RIFFLE / RUN LEADING TO THE PROPERTY FENCE.
- FLOW THROUGH CULVERT WAS MINIMAL - GRANULAR DEPOSIT OBSERVED IN CULVERT FROM CATCH BASIN ABOVE.
- OVERHANGING VEGETATION / UNDERCUT BANKS PROVIDED MOST COVER.
- ADULT BAITFISH OBSERVED DURING SURVEY WITHIN RUN AT DIS EXTENT - SPOOKED BEYOND PROPERTY FENCE.
- DIS OF FENCE IS OPEN PASTURE WITH LIVESTOCK - COWS THAT TRAVEL THROUGH CHANNEL.
- EVIDENCE OF EROSION / SLUMPING OBS. DIS ALONG BANKS.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

Ministry of Transportation

FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION						
Project # 201979404 - ASSIGN 4		Project Description: Hwy 401/POWER DAM			Date: JUNE 29, 2022	
Collectors: T. HOWSON / D. WOOD			Time Started: 15:00		Time Finished: 15:45	
Weather Conditions: OVERCAST, RAIN			Surface Conditions (If Applicable):			
			Calm ☒	Rippled ☐	Wavy ☐	Rough ☐
LOCATION						
Name of Waterbody: TRIB OF SOUTH RAISIN R.			Crossing #: 624/625		Station #:	
Location Of Crossing/Station:						
GPS Coordinates:			MTO Chainage:			
Township: CORNWALL			MNR District: KEMPVILLE			
SAMPLING LOCATIONS AND WATER CHEMISTRY						
Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream						
Downstream		20.	7.80	3.97	18.4	800
Culvert/Hwy ROW						
Water Colour:						
Colourless ☒	Yellow/Brown ☐	Blue/Green ☐	Turbid ☐	Other ☐		
GEAR						
Electrofisher:						
Length (m):		Settings:			Seconds:	
Nets and Traps:						
Minnow Trap: ☐ #		Dip Net ☒ #		Trap Net ☐ #		
Seine: ☐		Gill ☐		Other ☐ Specify:		
Hauls (#):		Period Of Time (24 Hour Clock):				
		Set Time:			Clear Time:	
Size of Net:						
Length (m):		Mesh Size:			Depth of Capture:	
		Smallest (cm):			Minimum (m):	
		Largest (cm):			Maximum (m):	

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Note: circle number if a sample was kept

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WATERCOURSE FIELD COLLECTION FORM

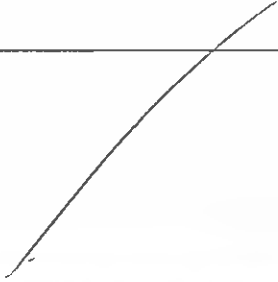
GENERAL INFORMATION				
Project # 2019794-04		Project Description: HWY 401/POWER DAM DRIVE		Date: APRIL 11, 2022
Is Stream Realignment required for this section: ☐ Yes ☐ No ☐ Unknown				
Collectors: T. HOWSON / D. WOOD		Time Started: 13:15	Time Finished: 14:45	
Weather Conditions:				
Air Temp (°C): 12	Water Temp (°C): 10.1	Conductivity (µS/cm): 411	Velocity (m/s):	
Photos Numbers And Descriptions:				
LOCATION				
Name of Waterbody: TRIB OF SOUTH RAISIN RIVER		Drainage System: SOUTH RAISIN RIVER	Crossing #: C17/C18	Station #:
Location Of Crossing:				
GPS Coordinates:		MTO Chainage:		
Township:		MNR District: KEMPTVILLE		
LAND USE AND POLLUTION				
Surrounding Land Use: RURAL RESIDENCE, ROADWAY, COMMERCIAL		Sources of Pollution: ROAD RUNOFF, LITTER		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☒	N/A ☐
Other ☐ (Describe)		Size: (w x h) m ²		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: UPSTREAM OF BOTH C17 + C18		Section Location: (Include On Habitat Map) WEST OF POWER DAM DRIVE / ACHISON RD		
Associated Wetland NO				
Stream / River ☐	Channelized ☒	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): 75m				

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C18

Sub-Sections:		Run ☒	OUTLET Pool ☒		Riffle ☐	Flats ☐	Culvert ☐	Other ☐
Percentage of Area:		95	5					
Mean wetted depth (m)		0.3	0.62					
Mean wetted width (m)		2.0	2.5					
Mean bankfull depth (m)		0.65	0.9					
Mean bankfull width (m)		4.5	4.5					
Substrate (type & %)		Gr, Cl, Mu, Sa, Si		Gr, Cl, Si, Mu				
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)
BANK STABILITY								
	Stable		Slightly Unstable		Moderately Unstable		Unstable	
Left Bank	☒		☐		☐		☐	
Right Bank	☒		☐		☐		☐	
	Deposition Zone		Protected Bank		Vulnerable Bank		Eroding Bank	
Left Bank	☐		☒		☐		☐	
Right Bank	☐		☒		☐		☐	
HABITAT								
In-Stream Cover (% surface area):								
Undercut banks:		Boulders:		Cobbles:		Organic Debris:		None ☒
						15		15
Vascular Macrophytes:					Woody Debris:			
Instream: 60					Instream: 5			
Overhanging: 5					Overhanging: /			

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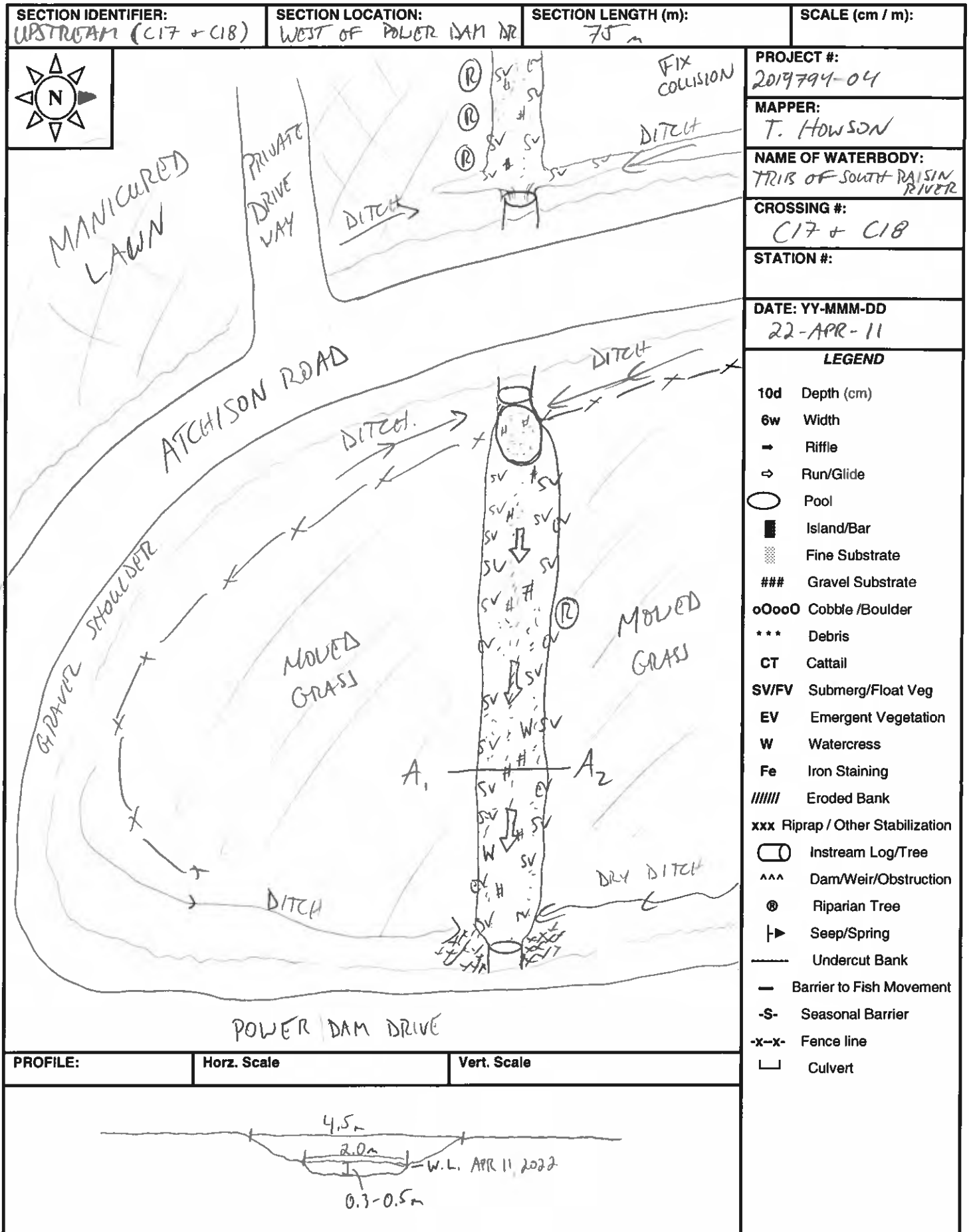
Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☒	None ☐
Vegetation Type:				
Vegetation Type (%)	Submergent: 60	Floating:	Emergent: 10	None 0
Predominant Species:	Grasses Watercress		Grass	30
MIGRATORY OBSTRUCTIONS				
Permanent 	Seasonal 	None 		
POTENTIAL CRITICAL HABITAT				
Spawning Baitfish (Chubs, Suckers)	Groundwater Watercress (limited but present)	Other 		
POTENTIAL ENHANCEMENT OPPORTUNITIES				
- PROPERLY EMBED INLET OF CIB AS INVERT IS -0.15m above STREAMBED CREATING INCREASED VELOCITY (HYDRAULIC JUMP UPSTREAM) - INCREASE CULVERT WIDTHS				

ADDITIONAL COMMENTS

- U/S OF CULVERT C18 IS STRAIGHT RUN BETWEEN COMMERCIAL PROPERTY (FIX COLLISION) TO THE NORTH + RURAL RESIDENCE TO THE SOUTH.
- BANKS STABLE U/S + D/S OF C18, WITH MATURE RIPARIAN TREES ALONG SOUTH BANK → INLET OF C18 ~0.15m ABOVE STREAMBED (0.4m OUT OF CULVERT/0.25m INSIDE).
- BETWEEN CULVERT C18 + C17 CHANNEL WAS MOSTLY STRAIGHT RUN WITH VARYING DEPTHS (0.3 - 0.5m) and OUTLET POOL AT C18.
- NO SHADING ALONG SEGMENT BETWEEN C18 + C17 AS BANKS CONSIST ENTIRELY OF MOWED GRASS.
- DESPITE LIMITED CHANNEL MORPHOLOGY DIVERSITY, INSTREAM HABITAT WAS DIVERSE + QUALITY ENOUGH TO SUPPORT ABUNDANT BAIT/FORAGE FISH COMMUNITY.
- STEADY FLOW THROUGHOUT CHANNEL
- DOMINANT SUBSTRATE WAS CLAY WITH GRAVEL.
- DOMINANT INSTREAM HABITAT WAS SUBMERGED VEG → PROVIDED GOOD COVER FOR SHINNERS/CHUBS/MUDMINNOWS + SUCKERS.
- LIKELY USED BY SHINNERS + CATFISH FOR SPawning.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

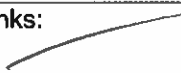
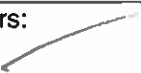


Ministry of Transportation

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # <i>201979404</i>		Project Description: <i>HWY 401 / POWER DAM DR.</i>		Date: <i>APRIL 11, 2022.</i>
Is Stream Realignment required for this section: ☐ Yes ☐ No ☒ Unknown				
Collectors: <i>T. HOWSON / D. WOOD.</i>		Time Started: <i>13:15</i>	Time Finished: <i>14:45</i>	
Weather Conditions:				
Air Temp (°C): <i>12 °C</i>	Water Temp (°C): <i>10.1 °C</i>	Conductivity (µS/cm): <i>411</i>	Velocity (m/s): <i>—</i>	
Photos Numbers And Descriptions: <i>—</i>				
LOCATION				
Name of Waterbody: <i>TRIB OF S. RAISIN RIVER,</i>		Drainage System: <i>RAISIN RIVER,</i>	Crossing #: <i>C 17 / C18</i>	Station #: <i>—</i>
Location Of Crossing: <i>SOUTH OF HWY 401 ON POWER DAM DRIVE.</i>				
GPS Coordinates: <i>—</i>		MTO Chainage: <i>UNKNOWN.</i>		
Township: <i>CORNWALL.</i>		MNR District: <i>KEMPTVILLE.</i>		
LAND USE AND POLLUTION				
Surrounding Land Use: <i>AGRICULTURE DIS.</i> <i>RURAL RESIDENTIAL, COMMERCIAL,</i>		Sources of Pollution: <i>RUNOFF, LITTER</i>		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☒	N/A ☐
Other ☐ (Describe) <i>—</i>		Size: (w x h) m ² <i>UNKNOWN.</i>		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: <i>DOWNSTREAM OF C 17.</i>		Section Location: (Include On Habitat Map) <i>EAST OF 1104</i>		
Associated Wetland				
Stream / River ☐	Channelized ☒	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): <i>75 m</i>				

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Sub-Sections:		Run ☒	Pool ☐	Riffle ☐	Flats ☒	Culvert ☐	Other ☐
Percentage of Area:		80%			20%		
Mean wetted depth (m)		0.35			0.25		
Mean wetted width (m)		2.5			6.0m		
Mean bankfull depth (m)		0.65			1.2m		
Mean bankfull width (m)		4.5			7.0m		
Substrate (type & %)		CL, GR, MU, SI, D			CL, GR, D SI, MU.		
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)
							Detritus (D)
BANK STABILITY							
	Stable		Slightly Unstable		Moderately Unstable		Unstable
Left Bank	☒		☐		☐		☐
Right Bank	☐		☒		☐		☐
	Deposition Zone		Protected Bank		Vulnerable Bank		Eroding Bank
Left Bank	☐		☐		☐		☐
Right Bank	☐		☐		☐		☒
HABITAT							
In-Stream Cover (% surface area):							
Undercut banks: 		Boulders: 		Cobbles: 		Organic Debris: 20%	None ☒ 35
Vascular Macrophytes:					Woody Debris:		
Instream: 40					Instream: 5		
Overhanging:					Overhanging:		

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Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☒	None ☐
Vegetation Type:				
Vegetation Type (%)	Submergent: 35%	Floating:	Emergent:	None ☒
Predominant Species:	GRASS, WATERCRESS ↳ VERY LITTLE			65%
MIGRATORY OBSTRUCTIONS				
Permanent	Seasonal	None		
POTENTIAL CRITICAL HABITAT				
Spawning	Groundwater	Other		
BAITFISH.	POTENTIAL - WATERCRESS.			
POTENTIAL ENHANCEMENT OPPORTUNITIES				
CLEAN DEBRIS DIS OF C/T AND STABILIZE BANKS U/S OF PRIVATE ACCESS CROSSING.				

ADDITIONAL COMMENTS

- D/S - RUN LEADING FROM OUTLET OF C17 WHICH INTERCEPTS DEBRIS JAM ~ 10-15 m D/S OF GUTLET.
- TIDALWEG IS FORCED INTO RIGHT BANK DUE TO DEBRIS JAM AND BANK EROSION IS PRESENT.
- PHRAG SURROUNDING OUTLET. INSTREAM GRASSES.
- LOW FLOW CHANNEL VISIBLE IN CENTRE OF CHANNEL.
- CHANNELIZED - NO SINUOSITY. - FLOWS THROUGH HEDGE ROW BETWEEN 2 AGRICULTURE FIELDS.
- MOSTLY CLAY SUBSTRATE - SAND, GRAVEL, SILT DETRITUS.
- CULVERTS POTENTIALLY UNDERSIZED - EVIDENCE OF HIGH FLOW.

→ NORTH

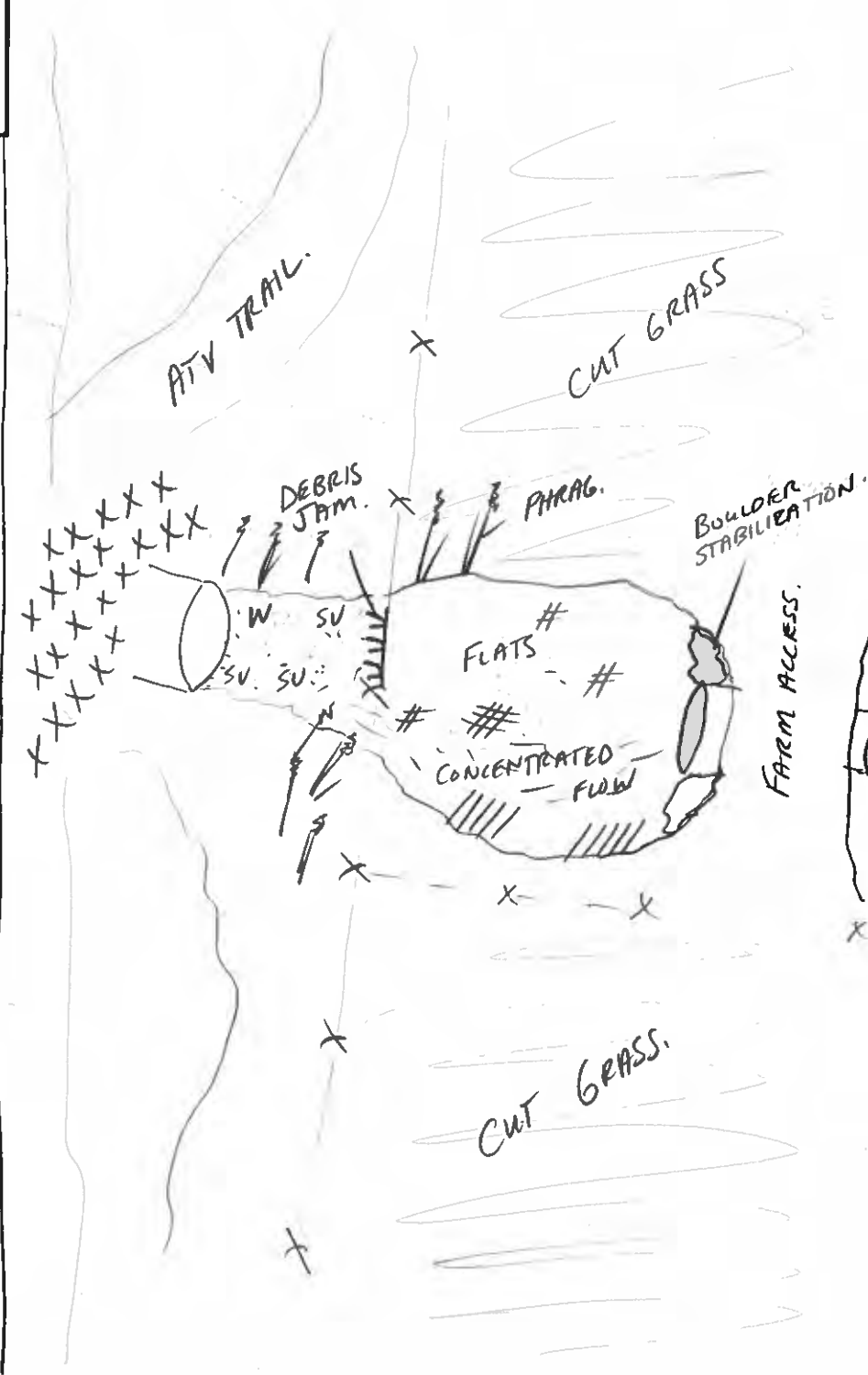
POWER DAM DR.

← SOUTH

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

SECTION IDENTIFIER: DOWNSTREAM OF C17	SECTION LOCATION: EAST OF POWERDAM DR.	SECTION LENGTH (m): ~30m	SCALE (cm / m): _____
---	--	------------------------------------	---------------------------------

		PROJECT #: 2019794 04
		MAPPER: D. WOOD
		NAME OF WATERBODY: TRIB OF S. RAISIN R.
		CROSSING #: C18
		STATION #: UNKNOWN.
		DATE: YY-MMM-DD 22-APR-11

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

Ministry of Transportation

FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION						
Project # <i>201979404-</i>		Project Description: <i>HWY 401 / POWER DAM DR.</i>			Date: <i>APRIL 11, 2022.</i>	
Collectors: <i>T. HOWSON / D. WOOD.</i>			Time Started: <i>13:15</i>		Time Finished:	
Weather Conditions: <i>OVERCAST, LIGHT BREEZE.</i>			Surface Conditions (If Applicable):			
			Calm ☒	Rippled ☐	Wavy ☐	Rough ☐
LOCATION						
Name of Waterbody: <i>TRIB OF SOUTH RAISIN.</i>			Crossing #: <i>C17/18</i>		Station #: <i>UNKNOWN</i>	
Location Of Crossing/Station: <i>SOUTH OF HWY 401</i>						
GPS Coordinates:			MTO Chainage: <i>UNKNOWN</i>			
Township: <i>CORNWALL.</i>			MNRF District: <i>KEMPTVILLE.</i>			
SAMPLING LOCATIONS AND WATER CHEMISTRY						
Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream	<i>—</i>	<i>12.6</i>	<i>8.62</i>	<i>—</i>	<i>10.1</i>	<i>411</i>
Downstream						
Culvert/Hwy ROW						
Water Colour:						
Colourless ☒	Yellow/Brown ☐	Blue/Green ☐	Turbid ☐	Other ☐		
GEAR						
Electrofisher:						
Length (m): <i>50m</i>		Settings: <i>150 V</i>			Seconds: <i>~600</i>	
Nets and Traps:						
Minnow Trap: ☐ #		Dip Net ☐ #		Trap Net ☐ #		
Seine: ☐		Gill ☐		Other ☐ Specify:		
Hauls (#):		Period Of Time (24 Hour Clock):				
		Set Time:			Clear Time:	
Size of Net:						
Length (m):		Mesh Size:			Depth of Capture:	
		Smallest (cm):			Minimum (m):	
		Largest (cm):			Maximum (m):	

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SAMPLE COLLECTION

Fish Kept? ☐ Yes ☒ No	Number of Bags	Preservative:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other (specify) ☐

ADDITIONAL COMMENTS

— ABUNDANT FISH THROUGHOUT ENTIRE REACH.

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

CAPTURE INFORMATION

Project #:		Crossing/Station #:			
No.	Scientific Name / Common Name	Physical Condition		Top Predator	
		# Fish with Blackspot	# Fish with Lesions, Tumours, Maturity etc.	Length (mm) F=Total Fork or L=Total Length	Age Class YOY/Adult
3	WHITE SUCKER.			L = 150	JUV.
13	COMMON SHINER			112mm L = 90	ADULT
6	CREEK CHUB.			L = 120mm	ADULT
6	CENTRAL MUD MINNOW			~50-70	ADULT
1	BLACK NOSE DACE.			60mm	ADULT

Note: circle number if a sample was kept

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COND: 860 μ S/cm pH: 7.39 T: 17.5°C D.O.: 5.16 mg/L.

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 201979404 - ASSIGN 4		Project Description: HWY 401 / POWER DAM		Date: JUNE 29, 2022
Is Stream Realignment required for this section: ☐ Yes ☐ No ☒ Unknown				
Collectors: T HOWSON / D. WOOD		Time Started: 08:30	Time Finished:	
Weather Conditions:				
Air Temp (°C):	Water Temp (°C): 17.5	Conductivity (μ S/cm): 860	Velocity (m/s):	
Photos Numbers And Descriptions:				
LOCATION				
Name of Waterbody: UNNAMED TRIBUTARY	Drainage System: SOUTH RAISIN RIVER	Crossing #: C17 / C18	Station #:	
Location Of Crossing:				
GPS Coordinates:		MTO Chainage:		
Township:		MNR District: KEMPTVILLE		
LAND USE AND POLLUTION				
Surrounding Land Use: RESIDENTIAL, COMMERCIAL, HIGHWAY		Sources of Pollution: RUNOFF, LITTER, FORDING BY GRASS MOWER.		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☒	N/A ☐
Other ☐ (Describe)		Size: (w x h) m ²		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: UPSTREAM		Section Location: (Include On Habitat Map) WEST OF POWER DAM		
Associated Wetland				
Stream / River ☐	Channelized ☒	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): 50 m				

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OUTLET OF

Sub-Sections:		Run ○	Pool ○	Riffle ○	Flats ✗	Culvert ○	Other ○	
Percentage of Area:					95		5	
Mean wetted depth (m)					0.2		0.4	
Mean wetted width (m)					1.1		2.0	
Mean bankfull depth (m)								
Mean bankfull width (m)								
Substrate (type & %)						Cl, Gr, Ma, Si, D.		Gr, Co, Cl, Ma, Si, D.
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)
BANK STABILITY								
	Stable		Slightly Unstable		Moderately Unstable		Unstable	
Left Bank	✗		○		○		○	
Right Bank	✗		○		○		○	
	Deposition Zone		Protected Bank		Vulnerable Bank		Eroding Bank	
Left Bank	○		✗		○		○	
Right Bank	○		✗		○		○	
HABITAT								
In-Stream Cover (% surface area):								
Undercut banks:		Boulders:		Cobbles:		Organic Debris:		None ○
						20		10
Vascular Macrophytes:					Woody Debris:			
Instream: 40					Instream:			
Overhanging: 30					Overhanging:			

Ministry of Transportation

Shore Cover (% stream shaded):				
100-90% ○	89-60% ○	59-30% ○	29-1% ☒	None ○
Vegetation Type:				
Vegetation Type (%)	Submergent: 10	Floating: 10	Emergent: 70	None ☒
Predominant Species:	WATERCRESS	WATERCRESS DUCKLEED GRASSES	GRASSES CATTAILS WATER PLANTAIN.	10
MIGRATORY OBSTRUCTIONS				
Permanent 	Seasonal - MAYBE LOW FLOW		None 	
POTENTIAL CRITICAL HABITAT				
Spawning - YES - CYPRINIDS. - MUDMINNOW	Groundwater - YES - WATERCRESS		Other - CENTRAL MUDMINNOW NURSERY.	
POTENTIAL ENHANCEMENT OPPORTUNITIES				
- MEASURES ALONG CHANNEL BANKS BETWEEN C17 + C18 TO PREVENT GRASS MOWER FROM FORDING CHANNEL ↳ RIPARIAN PLANTINGS ↳ FENCING				

ADDITIONAL COMMENTS

- OVERALL, HABITAT VERY DIFFERENT THAN SPRING SURVEY
 - ↳ LITTLE TO NO FLOW
 - ↳ REDUCED WATER DEPTH → POSSIBLE INTERMITTENT DURING DRY YEARS
- PRIMARY HABITAT FEATURE IN-WATER + OVERHANGING VEG,
 - ↳ GRASSES DOMINANT.
- CHANNEL BETWEEN C17 + C18 IMPACTED FROM GRASS MOUND FORDING THE CHANNEL. → CAUSED AREAS OF RUTTING IN CHANNEL.
- ABUNDANT WATERCRESS THROUGHOUT → GROUNDWATER SEEP/UPWELL NOT OBSERVED.
- DENSE WILD PARSNIP IN VICINITY

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

Ministry of Transportation

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 201979404 - MEGA 18		Project Description: HWY 401 / POWERDAM DR.		Date: JUNE 29, 2022
Is Stream Realignment required for this section: ☐ Yes ☐ No ☒ Unknown				
Collectors: T. HOWSON / D. WOOD		Time Started: 08:30	Time Finished:	
Weather Conditions: SUNNY, LIGHT BREEZE.				
Air Temp (°C): 21°	Water Temp (°C): 17.5	Conductivity (µS/cm):	Velocity (m/s):	
Photos Numbers And Descriptions:				
LOCATION				
Name of Waterbody: TRIB OF S. RAISIN R.		Drainage System: S. RAISIN RIVER	Crossing #: C17 / C18	Station #:
Location Of Crossing: POWER DAM DR, IMMEDIATELY NORTH ATCHISON RD.				
GPS Coordinates:		MTO Chainage: UNKNOWN.		
Township: CORNWALL		MNR District: KEMPTVILLE.		
LAND USE AND POLLUTION				
Surrounding Land Use: RESIDENTIAL, AGRICULTURE.		Sources of Pollution: RUNOFF, LITTER.		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☐	Open Foot Culvert ☐	CSP ☒	N/A ☐
Other ☐ (Describe)		Size: (w x h) m ² UNKNOWN.		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: DOWNSTREAM.		Section Location: (Include On Habitat Map) EAST OF POWERDAM		
Associated Wetland				
Stream / River ☐	Channelized ☒	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): 20m.				

DEBRIS
BLOCKAGE
AT FENCE.

Sub-Sections:		Run ○	Pool ○	Riffle ○	Flats Ø	Culvert Ø	Other Ø	
Percentage of Area:					90%		10%	
Mean wetted depth (m)					0.14	0.17	0.34	
Mean wetted width (m)					0.85	0.85	1.4	
Mean bankfull depth (m)								
Mean bankfull width (m)								
Substrate (type & %)		CL, GR, mu, SI, D.						
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)
			5%		30%	30%	30%	5%

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	Ø	○	○	○
Right Bank	Ø	○	○	○
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	○	○	○	○
Right Bank	○	○	○	○

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None ○
			30%	
Vascular Macrophytes:			Woody Debris:	
Instream: 25%			Instream: 5%	
Overhanging: 25			Overhanging:	

Ministry of Transportation

Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☒	None ☐
Vegetation Type:				
Vegetation Type (%)	Submergent: 20%	Floating: 10%	Emergent: 30%	None ☒ 60%
Predominant Species:	WATERCRESS	FL. ARROWHEAD.	(ATTMIS, GRASSES WATER PLANTAIN.	
MIGRATORY OBSTRUCTIONS				
Permanent NONE.	Seasonal LOW - FLOW.		None 	
POTENTIAL CRITICAL HABITAT				
Spawning CYPRINID.	Groundwater YES - WATERCRESS.		Other 	
POTENTIAL ENHANCEMENT OPPORTUNITIES				
- IMPROVE RIPARIAN - BANK STABILIZATION - HIGHLY ERODED ON PRIVATE PROPERTY.				

ADDITIONAL COMMENTS

- LOW FLOW COMPARED TO SPRING SURVEY - POSSIBLE INTERMITTENT DURING MID-LATE SUMMER.
- DENSE VEG SURROUNDING + WITHIN CHANNEL.
- REED CANARY, CATTAILS, FORBES, POSSIBLE PHRAGMITIS.
- MINIMAL FLOW + DENSE VEG THROUGH WIDENED SECTION AHEAD OF ENTRANCE CULVERT AT FARM ACCESS.
 ↳ POSSIBLE SEASONAL BARRIER TO FBH PASSAGE,

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

Ministry of Transportation

FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION						
Project # <i>201979404-ASSIGNY</i>		Project Description: <i>HWY 401/POWER DAM</i>			Date: <i>JUNE 29, 2022</i>	
Collectors: <i>T. HOWSON / D. WOOD</i>			Time Started: <i>08:30</i>		Time Finished: <i>10:00</i>	
Weather Conditions: <i>SUNNY, 10%, 21°C, SW-14 km/h</i>			Surface Conditions (If Applicable):			
			Calm ☒	Rippled ☐	Wavy ☐	Rough ☐
LOCATION						
Name of Waterbody: <i>TRIB OF SOUTH RAISIN R.</i>			Crossing #: <i>C17/C18</i>		Station #:	
Location Of Crossing/Station:						
GPS Coordinates:			MTO Chainage:			
Township: <i>CORNWALL</i>			MNR District:			
SAMPLING LOCATIONS AND WATER CHEMISTRY						
Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream		<i>21</i>	<i>7.39</i>	<i>5.16</i>	<i>17.5</i>	<i>860</i>
Downstream						
Culvert/Hwy ROW						
Water Colour:						
Colourless ☒	Yellow/Brown ☐	Blue/Green ☐	Turbid ☐	Other ☐		
GEAR						
Electrofisher:						
Length (m):		Settings:			Seconds:	
Nets and Traps:						
Minnow Trap: ☐ #		Dip Net ☒ #		Trap Net ☐ #		
Seine: ☐		Gill ☐		Other ☐ Specify:		
Hauls (#):		Period Of Time (24 Hour Clock):				
		Set Time:			Clear Time:	
Size of Net:						
Length (m):		Mesh Size:			Depth of Capture:	
		Smallest (cm):			Minimum (m):	
		Largest (cm):			Maximum (m):	

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SAMPLE COLLECTION					
Fish Kept? ☐ Yes ☒ No	Number of Bags	Preservative:			
		Formalin ☐	Frozen ☐	Alcohol ☐	Other (specify) ☐
ADDITIONAL COMMENTS - EVIDENT NURSERY HABITAT FOR MUDMINNOW, LIKELY FOR STICKLEBACK TO GIVEN HABITAT CONDITIONS. - HEAVILY IMPACTED FROM GRASS MOWER FORDING TIE CHANNEL.					
Additional Notes Appended? ☐ No ☐ Yes number of pages _____					
CAPTURE INFORMATION					
Project #:			Crossing/Station #:		
No.	Scientific Name / Common Name	Physical Condition		Top Predator	
		# Fish with Blackspot	# Fish with Lesions, Tumours, Maturity etc.	Length (mm) F=Total Fork or L=Total Length	Age Class YOY/Adult
12	CENTRAL MUDMINNOW	✓	✓	✓	YOY
1	BROOK STICKLEBACK	✓	✓	✓	ADULT

Note: circle number if a sample was kept

Ministry of Transportation

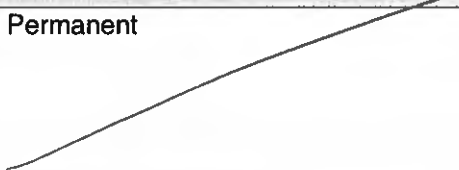
WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 2019794-04		Project Description: POWER DAM DR / HWY 401		Date: JUNE 29, 2022
Is Stream Realignment required for this section: ☐ Yes ☒ No ☐ Unknown				
Collectors: T. Howson / D. Wood.		Time Started: 14:00	Time Finished: 14:45	
Weather Conditions: RAIN / THUNDER STORM.				
Air Temp (°C): 23.°	Water Temp (°C): 16.1 °C	Conductivity (µS/cm):	Velocity (m/s):	
Photos Numbers And Descriptions:				
LOCATION				
Name of Waterbody: TRIB OF S. RAISIN R.		Drainage System: SOUTH RAISIN.	Crossing #: C22 / C23.	Station #:
Location Of Crossing: HWY 401 ~ 500m EAST OF POWERDAM DR.				
GPS Coordinates:		MTO Chainage: UNKNOWN		
Township: CORNWALL		MNR District: KEMPTVILLE.		
LAND USE AND POLLUTION				
Surrounding Land Use: AGRICULTURE / RURAL RESID		Sources of Pollution: LITTER, RUNOFF.		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐
Other ☐ (Describe)		Size: (w x h) m ² UNKNOWN.		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: UPSTREAM.		Section Location: (Include On Habitat Map) NORTH OF HWY		
Associated Wetland NO.				
Stream / River ☐	Channelized ☐	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): ~50m				

Ministry of Transportation

Sub-Sections:		Run ☒	Pool ☐	Riffle ☐	Flats ☐	Culvert ☐	Other ☐	
Percentage of Area:		100%						
Mean wetted depth (m)		0.15						
Mean wetted width (m)		0.8m						
Mean bankfull depth (m)		0.35						
Mean bankfull width (m)		1.2m						
Substrate (type & %)		Cl, mu, S.						
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)	Detritus (D)
BANK STABILITY								
	Stable	Slightly Unstable		Moderately Unstable		Unstable		
Left Bank	☒	☐		☐		☐		
Right Bank	☒	☐		☐		☐		
	Deposition Zone	Protected Bank		Vulnerable Bank		Eroding Bank		
Left Bank	☐	☐		☐		☐		
Right Bank	☐	☐		☐		☐		
HABITAT								
In-Stream Cover (% surface area):								
Undercut banks:	Boulders:	Cobbles:	Organic Debris:			None ☐		
			10%					
Vascular Macrophytes:					Woody Debris:			
Instream: 10%					Instream: 5%			
Overhanging: 30%					Overhanging:			

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Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☒	None ☐
Vegetation Type:				
Vegetation Type (%)	Submergent:	Floating:	Emergent:	None ☒
Predominant Species:		ALGAE.	GRASSES, FORBES, CATTAILS.	
MIGRATORY OBSTRUCTIONS				
Permanent 	Seasonal LOW FLOW	None 		
POTENTIAL CRITICAL HABITAT				
Spawning POTENTIAL BAITFISH.	Groundwater POSSIBLE. COOL WATER TEMP.	Other 		
POTENTIAL ENHANCEMENT OPPORTUNITIES				
None.				

ADDITIONAL COMMENTS

- NARROW CHANNEL FLOWS SOUTH ALONG HEDGEROW AT WEST SIDE OF AG - FIELD AND THEN EAST FOR ~ 30 m UNTIL REACHING ROW CLEARING ~ THEN FLOWS ~ 15m SOUTH TO INLET.
- CHANNEL IS DEFINED W/5 OF ROW CLEARING AND PARTIALLY DEFINED WITHIN.
- VEGETATION IS MOWED THROUGH W/5 CHANNEL WITHIN THE ROW.
- LOW QUALITY HABITAT WITH POTENTIAL GROUNDWATER INPUT.
- FISH ONLY CAPTURED IN MEDIAN WHERE GREATER DEPTHS EXISTED.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

Ministry of Transportation

WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 201979404 - ASSIGN 4		Project Description: HWY 401/POWER DAM		Date: JUNE 29, 2022
Is Stream Realignment required for this section: ☐ Yes ☐ No ☐ Unknown				
Collectors: T. HOWSON / D. WOOD		Time Started: 14:00	Time Finished: 14:45	
Weather Conditions:				
Air Temp (°C): 20	Water Temp (°C): 16.1	Conductivity (µS/cm): 550	Velocity (m/s):	
Photos Numbers And Descriptions:				
LOCATION				
Name of Waterbody: UNNAMED TRIBUTARY		Drainage System: SOUTH RAIN RIVER	Crossing #: C22123	Station #:
Location Of Crossing:				
GPS Coordinates:		MTO Chainage:		
Township: CORNWALL		MNRF District: KEMPTVILLE		
LAND USE AND POLLUTION				
Surrounding Land Use: HIGHWAY, PASTURE LAND		Sources of Pollution: RUNOFF, LITTER, GRASS MOWER		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐
Other ☐ (Describe)		Size: (w x h) m ²		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: DOWNSTREAM		Section Location: (Include On Habitat Map) SOUTH OF HWY 401		
Associated Wetland				
Stream / River ☒	Channelized ☐	Permanent ☒	Intermittent ☐	Ephemeral ☐
Total Section (Reach) Length (m): 20m (TO PROPERTY FENCE)				

Ministry of Transportation

Sub-Sections:	Run ☐	Pool ☐	Riffle ☐	Flats ☒	Culvert ☐	Other ☐		
Percentage of Area:				100				
Mean wetted depth (m)				0.2				
Mean wetted width (m)				3.0				
Mean bankfull depth (m)				N.A.C.				
Mean bankfull width (m)				N.A.C.				
Substrate (type & %)				Mu, Si, D, Gr.				
Bedrock (Br) ☒	Boulder (Bo) ☒	Cobble (Co) ☒	Gravel (Gr) 20	Sand (Sa) ☒	Silt (Si) 10	Clay (Cl) ☒	Muck (Mu) 50	Detritus (D) 20
BANK STABILITY - NO DEFINED BANKS								
	Stable	Slightly Unstable	Moderately Unstable	Unstable				
Left Bank	☐	☐	☐	☐				
Right Bank	☐	☐	☐	☐				
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank				
Left Bank	☐	☐	☐	☐				
Right Bank	☐	☐	☐	☐				
HABITAT								
In-Stream Cover (% surface area):								
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None				
			30	70				
Vascular Macrophytes: Instream: 50 Overhanging: 10				Woody Debris: Instream: Overhanging:				

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Shore Cover (% stream shaded):				
100-90% ○	89-60% ○	59-30% ○	29-1% ☒	None ○
Vegetation Type:				
Vegetation Type (%)	Submergent: 10	Floating: 20	Emergent: 40	None ☒
Predominant Species:	ALGAE	GRASS	GRASSES/FORBS	30
MIGRATORY OBSTRUCTIONS				
Permanent 	Seasonal POTENTIAL LOW FLOW BEYOND PROPERTY FENCE	None 		
POTENTIAL CRITICAL HABITAT				
Spawning - LIKELY - STICKLEBACK.	Groundwater - POSSIBLE DUE TO COOL WATER TEMP	Other 		
POTENTIAL ENHANCEMENT OPPORTUNITIES				
- MEASURES TO PROTECT CHANNEL FROM GRASS MOWER FORDING IMPACTS.				

ADDITIONAL COMMENTS

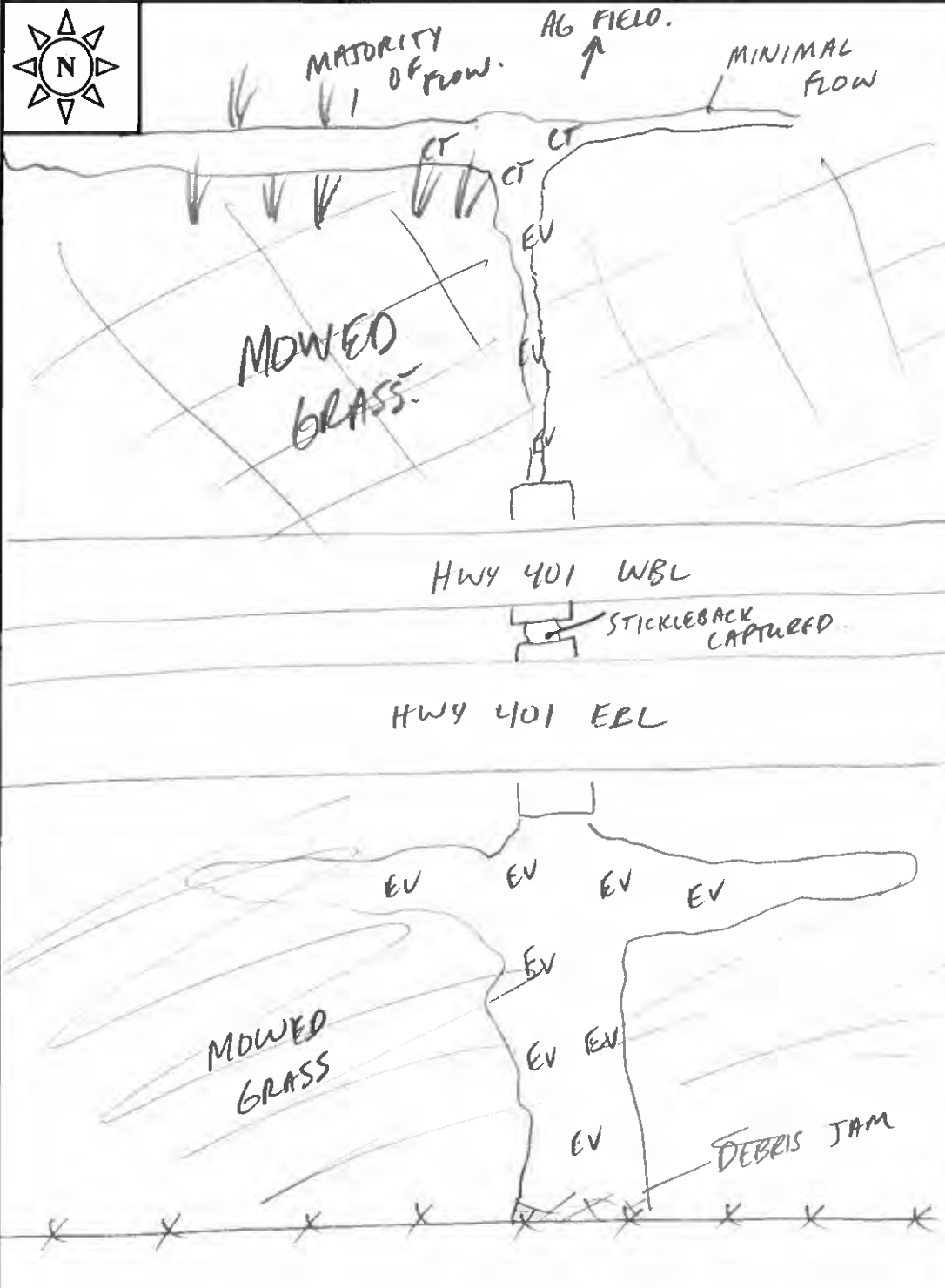
- DOWNSTREAM REACH ONLY ACCESSIBLE WITH 20m OF C22 OUTLET DUE TO PROPERTY FENCE.
- ENTIRE 20m REACH IS FLATS WITHIN GRASS SURF WITH NO DEFINED BANKS.
- CHANNEL IMPACTED BY ROW GRASS MOWING. A MOWER APPEARS TO FORD CHANNEL MULTIPLE TIMES
- LOW QUALITY HABITAT. BUT DOES SUPPLY SOUTH PRAIRIE RIVER WITH COLD/COOL WATER INPUTS.
- BROOK STICKLEBACK CAUGHT IN LESS DISTURBED AREA AT MIDDLE BETWEEN C22 + C23.
- POTENTIAL FOR LOW FLOW BARRIER DURING DRY YEARS BASED LIMITED FLOW/WATER PRESENT → IDENTIFIED AS PERMANENT FOR THIS SURVEY/PROJECT.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

SECTION IDENTIFIER: UP + DOWNSTREAM	SECTION LOCATION: NORTH / SOUTH OF HWY	SECTION LENGTH (m): 	SCALE (cm / m):
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PROJECT #:
 2019 794-04

MAPPER:
 D. WOOD.

NAME OF WATERBODY:
 TRIB OF S. RAISIN.

CROSSING #:
 C22123

STATION #:

DATE: YY-MMM-DD
 22-JUN-29.

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

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FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION						
Project # <i>201979404-Assign 4</i>		Project Description: <i>HWY 401/POWER DAM</i>			Date: <i>JUNE 29, 2022</i>	
Collectors: <i>T. HOLSON / D. WOOD</i>			Time Started: <i>14:00</i>		Time Finished:	
Weather Conditions: <i>OVERCAST, BRIZZLE</i>			Surface Conditions (If Applicable):			
			Calm ☐	Rippled ☐	Wavy ☐	Rough ☐
LOCATION						
Name of Waterbody: <i>TRIB OF SOUTH RAISIN RIVER</i>			Crossing #: <i>C 22/23</i>		Station #:	
Location Of Crossing/Station: <i>HWY 401, 500m EAST OF POWER DAM</i>						
GPS Coordinates:			MTO Chainage:			
Township: <i>CORNWALL</i>			MNR District: <i>KEMPTVILLE</i>			
SAMPLING LOCATIONS AND WATER CHEMISTRY						
Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream		<i>20</i>	<i>7.90</i>	<i>8.1</i>	<i>16.1</i>	<i>550</i>
Downstream						
Culvert/Hwy ROW						
Water Colour:						
Colourless ☒	Yellow/Brown ☐	Blue/Green ☐	Turbid ☐	Other ☐		
GEAR						
Electrofisher:						
Length (m):		Settings:			Seconds:	
Nets and Traps:						
Minnow Trap: ☐ #		Dip Net ☒ #		Trap Net ☐ #		
Seine: ☐		Gill ☐		Other ☐ Specify:		
Hauls (#):		Period Of Time (24 Hour Clock):				
		Set Time:			Clear Time:	
Size of Net:						
Length (m):		Mesh Size:			Depth of Capture:	
		Smallest (cm):			Minimum (m):	
		Largest (cm):			Maximum (m):	

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[illegible]

Note: circle number if a sample was kept

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WATERCOURSE FIELD COLLECTION FORM

C25

GENERAL INFORMATION				
Project # 201979404		Project Description: HWY 401 / POWERDAM DR.		Date: APRIL 11, 2022
Is Stream Realignment required for this section: ☐ Yes ☒ No ☐ Unknown				
Collectors: T. HOWSON / D. WOOD.		Time Started: 07:50	Time Finished: 08:30.	
Weather Conditions: SUNNY, COOL				
Air Temp (°C): 2.2	Water Temp (°C): 2.7°C	Conductivity (µS/cm): 462	Velocity (m/s): _____	
Photos Numbers And Descriptions: _____				
LOCATION				
Name of Waterbody: TRIB OF S. RAISIN RIVER		Drainage System: RAISIN RIVER.	Crossing #: C25	Station #:
Location Of Crossing: EAST OF POWERDAM DR.				
GPS Coordinates: 45.05445 74.79586		MTO Chainage: UNKNOWN		
Township: CORNWALL		MNR District: KEMPTVILLE.		
LAND USE AND POLLUTION				
Surrounding Land Use: AGRICULTURE, RESIDENTIAL, HWY 401		Sources of Pollution: GARBAGE, HWY RUNOFF.		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐
Other ☐ (Describe) _____		Size: (w x h) m ² _____		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: UPSTREAM		Section Location: (Include On Habitat Map) NORTH OF 401.		
Associated Wetland NO				
Stream / River ☐	Channelized ☐	Permanent ☐	Intermittent TBC ☒	Ephemeral ☐
Total Section (Reach) Length (m): 15-20m				

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Sub-Sections:		Run ☒	Pool ☐	Riffle ☐	Flats ☐	Culvert ☐	Other ☐
Percentage of Area:		100%					
Mean wetted depth (m)		0.3m					
Mean wetted width (m)		3.0m					
Mean bankfull depth (m)		0.6m					
Mean bankfull width (m)		4.0m					
Substrate (type & %)		Si, Mu D.					
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si) 40	Clay (Cl)	Muck (Mu) 40 Detritus (D) 20

BANK STABILITY				
	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Bank	☒	☐	☐	☐
Right Bank	☒	☐	☐	☐
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank
Left Bank	☐	☐	☐	☐
Right Bank	☐	☐	☐	☐

HABITAT				
In-Stream Cover (% surface area):				
Undercut banks:	Boulders:	Cobbles:	Organic Debris: 10%	None ☐ 20%
Vascular Macrophytes: Instream: 60% Overhanging: 10%			Woody Debris: Instream: NONE Overhanging:	

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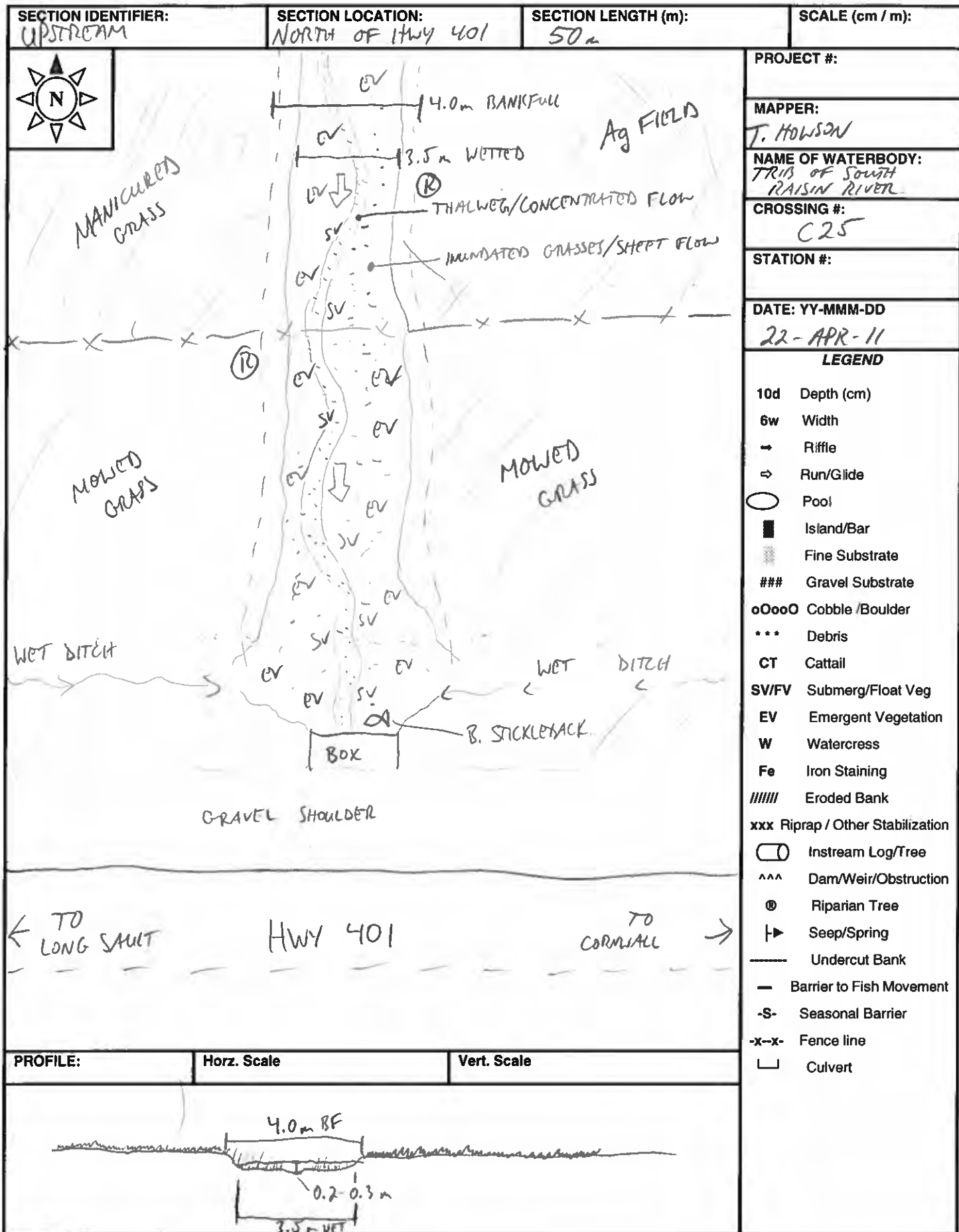
Shore Cover (% stream shaded):				
100-90% ○	89-60% ○	59-30% ○	29-1% Ø	None ○
Vegetation Type:				
Vegetation Type (%)	Submergent: 20%	Floating:	Emergent: 40%	None Ø 20%
Predominant Species:	GRASSES.		GRASSES. - APPEAR TO BE MANICURED, LIKELY INTERMITTENT	
MIGRATORY OBSTRUCTIONS				
Permanent 	Seasonal 	None 		
POTENTIAL CRITICAL HABITAT				
Spawning STICKLEBACK.	Groundwater 	Other		
POTENTIAL ENHANCEMENT OPPORTUNITIES				
NONE.				

ADDITIONAL COMMENTS

- UPSTREAM - PARTIALLY DEFINED CHANNEL FLOWS THROUGH DEPRESSION IN AG. FIELDS, - SOME RIPARIAN TREES UPSTREAM - PRIVATE,
- VISIBLE FLOW THROUGHOUT CHANNEL - CONCENTRATED IN CENTRE AND FLOODED MARGINS,
 - MANICURED GRASS WITHIN HIGHWAY ROW - DEPTH INCREASES SLIGHTLY AT INLET,
 - STICKLEBACK CAPTURED AT INLET BY DIP-NET (GRAVID FEMALE).
 - TRICKLE OF FLOW THROUGH DITCH LINES,
 - CUT GRASS IN HWY ROW SUGGESTS THAT CHANNEL IS INTERMITTENT.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____



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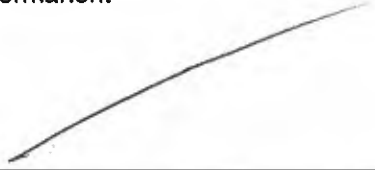
WATERCOURSE FIELD COLLECTION FORM

GENERAL INFORMATION				
Project # 2019794-04		Project Description: Hwy 401 / POWER DAM DR.		Date: APRIL 11, 2022.
Is Stream Realignment required for this section: ☐ Yes ☐ No ☒ Unknown				
Collectors: T. HOWSON / D. WOOD.		Time Started: 12:00	Time Finished: 12:40	
Weather Conditions: SUNNY, LIGHT BREEZE.				
Air Temp (°C): 12°C	Water Temp (°C): 2.7	Conductivity (µS/cm): 462	Velocity (m/s):	
Photos Numbers And Descriptions: /				
LOCATION				
Name of Waterbody: TRIB OF S. RAISIN RIVER		Drainage System: RAISIN RIVER	Crossing #: C25	Station #: /
Location Of Crossing: EAST OF HWY 401 / POWER DAM INTERSECTION.				
GPS Coordinates: 45.05445 74.79586.		MTO Chainage: UNKNOWN.		
Township: CORNWALL.		MNR District: KEMPTVILLE.		
LAND USE AND POLLUTION				
Surrounding Land Use: Hwy 401, RURAL RES, AGRICULTURE.		Sources of Pollution: Hwy 401 RUNOFF, LITTER.		
EXISTING STRUCTURE TYPE				
Bridge ☐	Box Culvert ☒	Open Foot Culvert ☐	CSP ☐	N/A ☐
Other ☐ (Describe) /		Size: (w x h) m² UNKNOWN.		
SECTION TYPE AND MORPHOLOGY				
Section (Reach) Identifier: DOWNSTREAM.		Section Location: (Include On Habitat Map) SOUTH.		
Associated Wetland				
Stream / River ☐	Channelized ☐	Permanent ☐	Intermittent ☒ CONFIRM SUMMER	Ephemeral ☐
Total Section (Reach) Length (m): 30 m.				

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Sub-Sections:		Run ○	Pool ○	Riffle ○	Flats Ø	Culvert ○	Other ○
Percentage of Area:					100%		
Mean wetted depth (m)					0.25		
Mean wetted width (m)					4.5		
Mean bankfull depth (m)					0.45		
Mean bankfull width (m)					5.5		
Substrate (type & %)					mu, si, d		
Bedrock (Br)	Boulder (Bo)	Cobble (Co)	Gravel (Gr)	Sand (Sa)	Silt (Si)	Clay (Cl)	Muck (Mu)
					20%		60%
							10%
BANK STABILITY							
	Stable	Slightly Unstable	Moderately Unstable	Unstable			
Left Bank	Ø	○	○	○			
Right Bank	Ø	○	○	○			
	Deposition Zone	Protected Bank	Vulnerable Bank	Eroding Bank			
Left Bank	○	○	○	○			
Right Bank	○	○	○	○			
HABITAT							
In-Stream Cover (% surface area):							
Undercut banks:	Boulders:	Cobbles:	Organic Debris:	None			
			10%	Ø	80%		
Vascular Macrophytes:				Woody Debris:			
Instream: 10% - GRASS,				Instream:			
Overhanging:				Overhanging:			

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Shore Cover (% stream shaded):				
100-90% ☐	89-60% ☐	59-30% ☐	29-1% ☒	None ☐
Vegetation Type:				
Vegetation Type (%)	Submergent: 51.	Floating: 	Emergent: 51.	None ☒
Predominant Species:	GRASS		GRASS.	90%
MIGRATORY OBSTRUCTIONS				
Permanent 	Seasonal AT PROPERTY FENCE DUE TO DEBRIS / LITTER.		None 	
POTENTIAL CRITICAL HABITAT				
Spawning 	Groundwater NO EVIDENCE.		Other	
POTENTIAL ENHANCEMENT OPPORTUNITIES				
NONE.				

ADDITIONAL COMMENTS

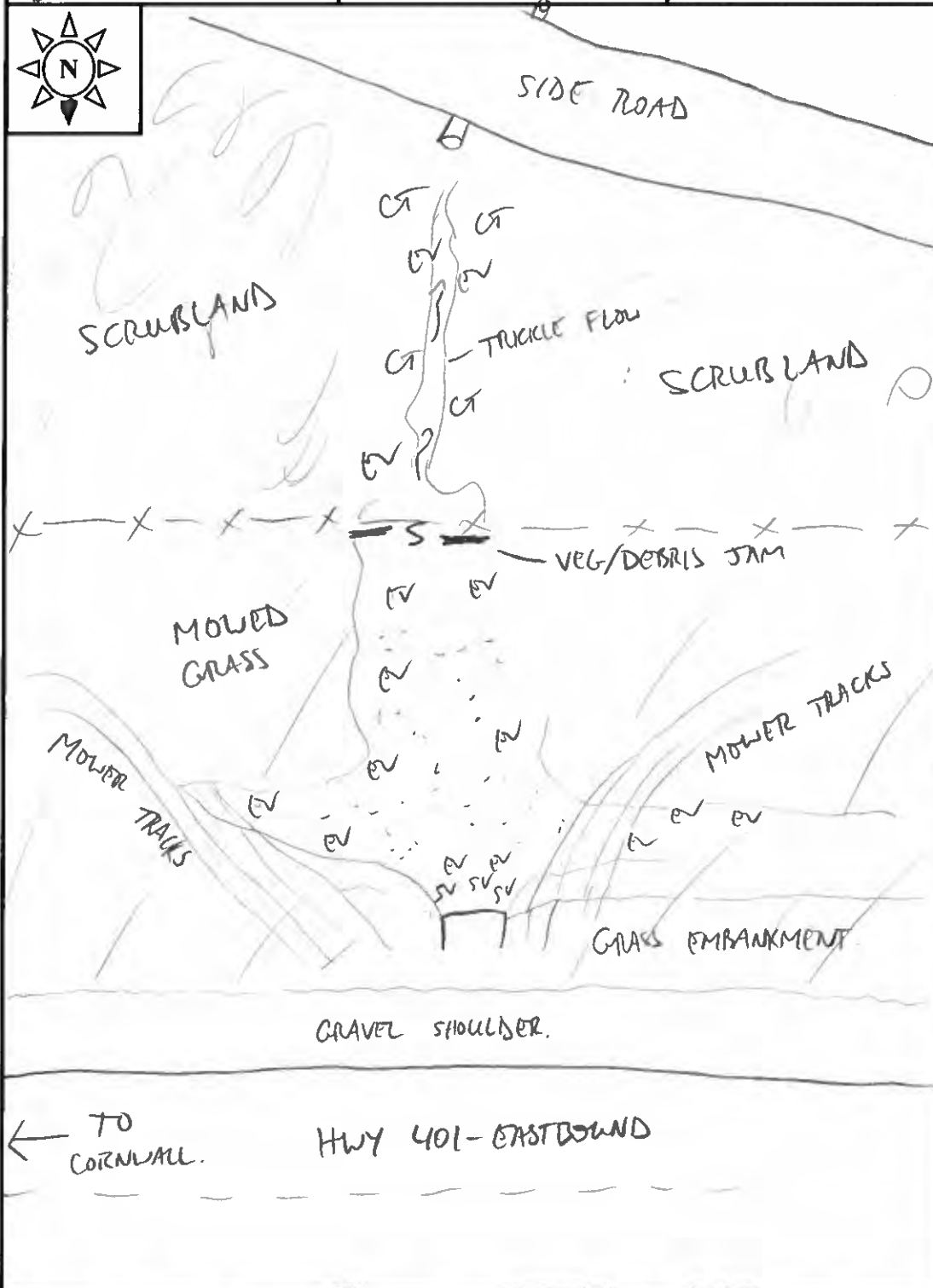
- LOW QUALITY, HOMOGENOUS HABITAT
- POTENTIAL INTERMITTENT - CONFIRM SUMMER.
- NO RIPARIAN COVER IN ROW.

Additional Notes Appended? ☐ No ☐ Yes

Number of Pages _____

SECTION IDENTIFIER: DOWNSTREAM	SECTION LOCATION: SOUTH OF HWY 401	SECTION LENGTH (m): 150m	SCALE (cm / m):
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PROJECT #: 2019794-04
MAPPER: T. HOWSON
NAME OF WATERBODY: TRIB OF SOUTH DAIKIN RIVER
CROSSING #: C25
STATION #:
DATE: YY-MMM-DD 22-APR-11

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

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FISH COMMUNITY INVENTORY FORM

GENERAL INFORMATION						
Project # <i>201979404</i>		Project Description: <i>ASSIGN 4 - HWY 401/POWER DAM RD.</i>			Date: <i>APRIL 11, 2022</i>	
Collectors: <i>T. HOLSON / D. WOOD</i>			Time Started: <i>07:50 / 12:00</i>		Time Finished: <i>08:30 / 13:00</i>	
Weather Conditions: <i>SUNNY, CALM, 1°C</i>			Surface Conditions (If Applicable):			
			Calm ☒	Rippled ☐	Wavy ☐	Rough ☐
LOCATION						
Name of Waterbody: <i>TRIB OF SOUTH RABIN RIVER</i>			Crossing #: <i>C25</i>		Station #:	
Location Of Crossing/Station: <i>EAST OF POWERDAM DR.</i>						
GPS Coordinates: <i>45.05445 74.79586</i>			MTO Chainage: <i>UNKNOWN</i>			
Township:			MNRF District: <i>KEMPTVILLE</i>			
SAMPLING LOCATIONS AND WATER CHEMISTRY						
Location:	Length (m)	Air Temp. (°C)	pH	Dissolved Oxygen (mg/L)	Water Temp (°C)	Conductivity (µS/cm)
Upstream	<i>~20-50</i>	<i>2°C</i>	<i>9.86</i>	<i>—</i>	<i>2.7°C</i>	<i>462</i>
Downstream						
Culvert/Hwy ROW						
Water Colour:						
Colourless ☒	Yellow/Brown ☐	Blue/Green ☐	Turbid ☐	Other ☐		
GEAR						
Electrofisher:						
Length (m):		Settings:			Seconds:	
Nets and Traps:						
Minnow Trap: ☐ #		Dip Net ☒ #		Trap Net ☐ #		
Seine: ☐		Gill ☐		Other ☐ Specify:		
Hauls (#):		Period Of Time (24 Hour Clock):				
		Set Time:			Clear Time:	
Size of Net:						
Length (m):		Mesh Size:			Depth of Capture:	
		Smallest (cm):			Minimum (m):	
		Largest (cm):			Maximum (m):	

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[illegible]

Note: circle number if a sample was kept