

Ministry of Transportation (MTO)

Fish and Fish Habitat Existing Conditions Report – FINAL

Highway 400 – Highway 404 Link (Bradford Bypass)

W.O. #19-2001

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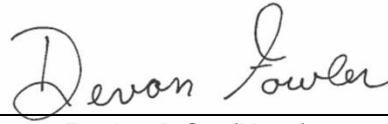
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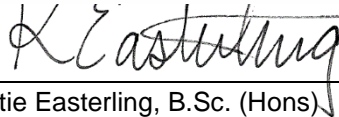
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Table of Contents

	page
1. Introduction	1
1.1 Environmental Protection Requirements	2
1.1.1 Endangered Species Act (ESA).....	2
1.1.2 Fisheries Act and Species at Risk Act (SARA)	4
2. Methods	5
2.1 Document Review.....	5
3. Existing Conditions.....	7
3.1 Watersheds	7
3.1.1 Innisfil Creek Subwatershed (WC-01).....	7
3.1.2 West Holland River Subwatershed (WC-02 to WC-08)	7
3.1.3 East Holland River Subwatershed (WC-09 to WC-27)	8
3.1.4 Maskinonge River Subwatershed (WC-28).....	8
3.2 Watercourse Crossings.....	8
3.2.1 Watercourse Crossing 1 (WC-01): Tributary to Penville Creek	8
3.2.2 Watercourse Crossing 2 (WC-02): Fraser Creek	9
3.2.3 Watercourse Crossing 3 (WC-03): Tributary to Fraser Creek	10
3.2.4 Watercourse Crossing 4 and 5 (WC-04 and WC-05): Tributaries to Fraser Creek	10
3.2.5 Watercourse Crossing 6 and 7 (WC-06 and WC-07): Tributaries to West Holland River.....	11
3.2.6 Watercourse Crossing 8 (WC-08): West Holland River (Holland River West Branch)	11
3.2.7 Watercourse Crossing 9 to 20 (WC-09 to WC-20): West Holland River Tributary and Unnamed Drains.....	12
3.2.8 Watercourse Crossing 21 (WC-21): East Holland River (Holland River East Branch)	12
3.2.9 Watercourse Crossing 22 (WC-22): Holborn Drain	13
3.2.10 Watercourse Crossing 23 (WC-23): Ravenshoe/Boag Drain	13
3.2.11 Watercourse Crossings 24 to 27 (WC-24 to WC-27): Tributaries to Ravenshoe/Boag Drain	14
3.2.12 Watercourse Crossing 28 (WC-28): Maskinonge River.....	14
3.3 Waterbodies	15
3.3.1 Fraser Creek Pond (WB-01).....	15
3.3.2 Online Ponds to WC-04 (Tributary to Fraser Creek) (WB-02 and WB-03)	15
3.3.3 Sliver Lakes Golf Course Ponds (WB-04).....	15
3.3.4 Holborne Drain Irrigations Ponds (WB-05)	16
3.3.5 Tributary to Ravenshoe/ Boag Drain Irrigation Ponds (WB-06, WB-07 and WB-08).....	16
3.4 Fish Community Summary.....	16

3.4.1 Aquatic SAR..... 16

4. Determination of Significance..... 23

5. Limitations of the Report..... 24

6. Recommendations 25

7. Literature Cited..... 26

List of Figures

Figure 1. Study Area 3

List of Tables

Table 1. Location of Work (Template D1)..... 1

Table 2. Existing Fish and Fish Habitat Conditions Summary Table (Template D2) 17

Appendices

- Appendix A. Aquatic Features Mapping (Figure 2.1 to Figure 2.5)
- Appendix B. Correspondence with Regulatory Agencies

1. Introduction

The Ontario Ministry of Transportation (MTO) completed a route planning study for the “*Highway 400 – Highway 404 Extension Link (Bradford Bypass), W.P. 377-90-00*” (December 1997) and a subsequent Environmental Assessment and Recommended Plan were approved in 2002. The MTO has retained AECOM Canada Ltd. (AECOM) to undertake preparatory work for the upcoming re-initiation of design activity for the Bradford Bypass, which will be completed to a Preliminary Design level of detail.

As described in the *Environmental Assessment Report One – Stage Submission: Highway 400 – Highway 404 Extension Link (Bradford Bypass) W.P. 377-90-00* (McCormick Ranking Corporation, 1997), hereafter referred to as the 1997 EA, the Bradford Bypass consists of the development a new 16.2 km rural 4-lane controlled access freeway located in the County of Simcoe and Regional Municipality of York. The Bradford Bypass Recommended Plan (herein referred to as Recommended Plan) connects Highway 400 in Bradford West Gwillimbury to Highway 404 in East Gwillimbury, located north of, and parallel to, Highway 88 in Bradford West Gwillimbury and Queensville Sideroad (York Road 77) in East Gwillimbury. As part of this retainer assignment, an alignment shift based on design refinements was implemented by AECOM and constitutes the Recommended Plan. Study Area for this report includes the Recommended Plan, its Right of Way (RoW), plus a 500 m buffer to the north and south (i.e., 17,600 km² Study Area for the 16 km long, 1.1 km wide Study Area with buffer). Refer to **Figure 1** for the Study Area boundaries.

The purpose of this report is to present a desktop review of fish and fish habitat existing conditions in the study area. Information gaps identified in this review (e.g. field investigations) that are required to bring the existing conditions up to date are carried forward as recommendations for the preliminary design stage. This report was completed in accordance with Section 3: Background Data collection of *MTO Environmental Guide for Fish and Fish Habitat (MTO, 2019)* and the pilot MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings (Version 3; 2016).

Table 1 below provides the Universal Transverse Mercator (UTM) coordinates for each watercourse crossing identified from data retrieved from the Land Information Ontario (LIO) database.

Table 1. Location of Work (Template D1)

Map ID #	Waterbody	Geographic Township, Municipality	Location of Waterbody (UTM Coordinates)	
			Easting	Northing
WC-01	Tributary to Penville Creek	Town of Bradford West Gwillimbury, County of Simcoe	609218	4885909
WC-02	Fraser Creek	Town of Bradford West Gwillimbury, County of Simcoe	609930	4886069
WB-01	Fraser Creek Pond	Town of Bradford West Gwillimbury, County of Simcoe	610069	4885842
WC-03	Tributary to Fraser Creek	Town of Bradford West Gwillimbury, County of Simcoe	610547	4886272
WB-02	Online Pond to WC-04	Town of Bradford West Gwillimbury, County of Simcoe	611554	4886645
WB-03	Online Pond to WC-04	Town of Bradford West Gwillimbury, County of Simcoe	611634	4886778
WC-04	Tributary to Fraser Creek	Town of Bradford West Gwillimbury, County of Simcoe	612791	4886960
WC-05	Tributary to Fraser Creek	Town of Bradford West Gwillimbury, County of Simcoe	613197	4887078
WC-07	Tributary to West Holland River	Town of Bradford West Gwillimbury, County of Simcoe	615762	4887454
WC-07	Tributary to West Holland River	Town of Bradford West Gwillimbury, County of Simcoe	615116	4887564
WC-08	West Holland River	Town of Bradford West Gwillimbury, County of Simcoe	616323	4887569
WC-09	Tributary to West Holland River	Township of King, Regional Municipality of York	616421	4887579
WC-10	Unnamed Drain	Township of King, Regional Municipality of York	616752	4887653
WC-11	Unnamed Drain	Township of King, Regional Municipality of York	616797	4887641
WC-12	Unnamed Drain	Township of King, Regional Municipality of York	616827	4887700

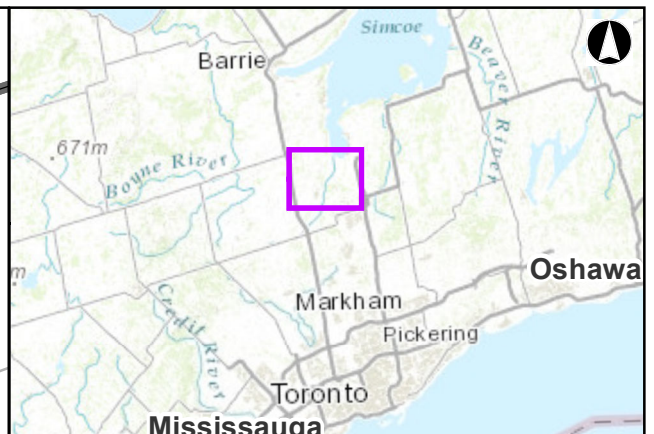
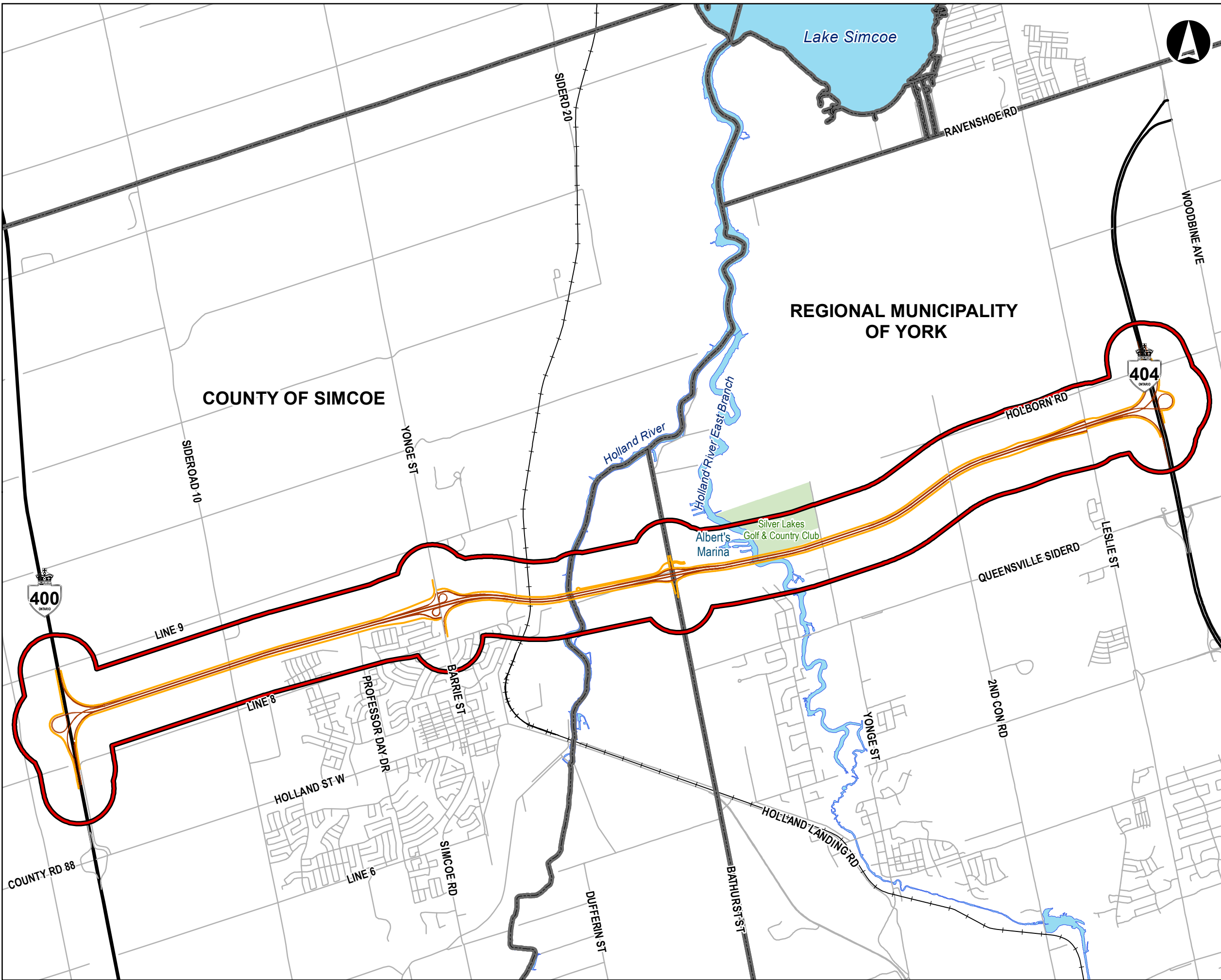
Map ID #	Waterbody	Geographic Township, Municipality	Location of Waterbody (UTM Coordinates)	
			Easting	Northing
WC-13	Unnamed Drain	Township of King, Regional Municipality of York	616879	4887657
WC-14	Unnamed Drain	Township of King, Regional Municipality of York	616949	4887722
WC-15	Unnamed Drain	Township of King, Regional Municipality of York	617035	4887722
WC-16	Unnamed Drain	Township of King, Regional Municipality of York	617100	4887710
WC-17	Unnamed Drain	Township of King, Regional Municipality of York	617195.7362	4887766.187
WC-18	Unnamed Drain	Township of King, Regional Municipality of York	617263	4887804
WC-19	Unnamed Drain	Township of King, Regional Municipality of York	617304	4887800
WC-20	Unnamed Drain	Town of East Gwillimbury, Regional Municipality of York	617654	4887836
WC-21	East Holland River	Town of East Gwillimbury, Regional Municipality of York	618939	4888106
WB-04	Silver Lakes Golf Course Ponds	Town of East Gwillimbury, Regional Municipality of York	619215	4888519
WC-22	Holborne Drain	Town of East Gwillimbury, Regional Municipality of York	620961	4888719
WB-05	Holborne Drain Irrigations Ponds	Town of East Gwillimbury, Regional Municipality of York	620961,	4888719
WC-23	Ravenshoe/ Boag Drain	Town of East Gwillimbury, Regional Municipality of York	621711	4889266
WC-24	Tributaries to Ravenshoe/ Boag Drain	Town of East Gwillimbury, Regional Municipality of York	622946	4889756
WC-25	Tributaries to Ravenshoe/ Boag Drain	Town of East Gwillimbury, Regional Municipality of York	623418	4889926
WB-06	Tributaries to Ravenshoe/ Boag Drain Irrigation Ponds	Town of East Gwillimbury, Regional Municipality of York	623398	4889840
WC-26	Tributaries to Ravenshoe/ Boag Drain	Town of East Gwillimbury, Regional Municipality of York	623672	4889997
WB-07	Tributaries to Ravenshoe/ Boag Drain Irrigation Ponds	Town of East Gwillimbury, Regional Municipality of York	623872	4889639
WC-27	Tributaries to Ravenshoe/ Boag Drain	Town of East Gwillimbury, Regional Municipality of York	623941	4890096
WB-08	Tributaries to Ravenshoe/ Boag Drain Irrigation Ponds	Town of East Gwillimbury, Regional Municipality of York	623971	4890102
WC-28	Maskinonge (Jersey) River	Town of East Gwillimbury, Regional Municipality of York	624846	4890350

1.1 Environmental Protection Requirements

1.1.1 Endangered Species Act (ESA)

On April 1, 2019, administration of the *Endangered Species Act* (ESA) shifted from the Ministry of Natural Resources and Forestry (MNR) to the Permissions and Compliance team within the new Species at Risk Branch of the Ministry of Environment, Conservation and Parks (MECP). All policy, agreement, authorizations, compliance and all other matters under the ESA are now handled by the MECP. Section 9 and 10 of the ESA prohibits the killing, harming or harassment of Endangered or Threatened species and the damage or destruction of their habitat. Changes to the ESA legislation now require a proponent-driven desktop screening of all potential Species at Risk (SAR) and SAR habitat that may exist at or near their proposed project location by referring to all the applicable information sources provided in the Preliminary Screening Guide (MECP, 2019), prior to Ministry correspondence.

As per the completed desktop screening (sources listed in **Section 2.1**), no provincial aquatic SAR or aquatic SAR habitats were identified to be present within the Study Area. On December 4, 2019 the completed desktop screening was provided to the MECP for review. MECP response identified an occurrence of American Eel, recorded in 2011, within the Holland River (i.e., West Holland River) north of the Study Area. American Eel is a fish species listed as Endangered as per the provincial ESA (2007), therefore it is afforded protection under Section 9 and 10 of this legislation.



Legend

- Highway 400 - Highway 404 Link (Bradford Bypass) Alignment
- Highway 400 - Highway 404 Link (Bradford Bypass) Right of Way
- Study Area
- Rail

Roads

- Provincial Highway
- Other

Boundaries

- Municipality Boundary
- Waterbody

0 0.5 1 2 3
Kilometers

Highway 400 - Highway 404 Link (Bradford Bypass)

Study Area		
Jan 2020	1:52,000 <small>* when printed 11"x17"</small>	Datum: NAD 1983 UTM Zone 17N Source: Imagery Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN,
	V: Study Area	Figure 1

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1.1.2 Fisheries Act and Species at Risk Act (SARA)

The Governing Authority for this legislation is Fisheries and Oceans Canada (DFO). On August 28, 2019, DFO brought into force new Fish and Fish Habitat Protection Provisions of the *Fisheries Act*. The 2019 changes to the Act observes a return to certain policies that were enforced prior to the 2012 *Fisheries Act* amendments, focusing on the following key concepts:

- Protecting all fish and fish habitat (i.e., the focus is no longer on only protecting Commercial, Recreational and Aboriginal [CRA] fisheries);
- Restoring the previous prohibition against ‘harmful alteration, disruption or destruction of fish habitat’ (HADD); and
- Restoring a prohibition against causing ‘the death of fish by any other means than fishing’.

Included in the new Fish and Fish Habitat Protections is creation of Standards and Codes of Practice that will specify procedures, practices or standards in relation to specific types of work, undertakings and activities during construction, operation, modification, etc. Use of the Standards and Codes of Practices will be contingent on providing DFO advance notice before conducting allowable activities in fish habitat.

Until new Standard and Codes of Practice are published, MTO will continue to use the guidelines set out in the MTO/DFO/MNRF Fisheries Protocol (Version 3; 2016). MTO Best Management Practices and Routine Works, as identified in the MTO Best Management Practices Manual for Fisheries (Draft for Pilot, Version 2.3, 2018), will still be used in the fish and fish habitat impact assessment to be completed in future project stages.

If BMPs cannot be applied, then the fisheries assessment process will continue. However, instead of Fisheries Assessment Specialists determining the likelihood that the project may result in ‘serious harm’ to fish and fish habitat, the determination of HADD will be completed for each proposed project activity and associated waterbody using the Pathways of Effects (PoE) diagrams and assessment table.

Where MTO determines, based on the outcome of the fisheries assessment, that proposed project activities are likely to cause HADD, and/or where federally listed aquatic SAR are present, MTO shall refer the project to DFO, requesting a project review under the fish and fish habitat protection provisions of the *Fisheries Act* and under the *Species at Risk Act* (SARA) (if applicable).

Resulting from the desktop screening of sources listed in **Section 2.1**, no federal aquatic SAR or aquatic SAR habitats were identified to be present within the Study Area. However, as noted in Section 1.1.1, the MECP identified an occurrence of American Eel, recorded in 2011, within the Holland River (i.e., West Holland River) north of the Study Area. American Eel is listed federally as Threatened; however, it has no status or schedule as per the federal SARA (2002) and is therefore is not afforded federal protection.

2. Methods

This report was completed in accordance with Section 3: Background Data Collection of MTO Environmental Guide for Fish and Fish Habitat (MTO, 2019) and the pilot MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings (Version 3; 2016). A desktop review of all relevant and available documents was completed to obtain information on fish and fish habitat within the Study Area. As part of the desktop review, external agencies were consulted to acquire background information. A copy of agency correspondence can be found in **Appendix A**. Results of the desktop review are discussed as part of **Section 3** below.

The following reports were reviewed:

- *Environmental Assessment Report One – Stage Submission: Highway 400 – Highway 404 Extension Link (Bradford Bypass) W.P. 377-90-00* (McCormick Rankin Corporation, 1997) (the 1997 EA);
- *Natural Environment and Agricultural Biophysical Assessment: 400 – 404 Extension Link* (McCormick Rankin Corporation, 1997) (Appendix G to the 1997 EA).
- *Bradford Bypass Fisheries Report -2001- Ministry of Transportation* (AMEC Earth & Environmental Limited, 2002)

Details regarding dates of field investigations, methods and elaborated results can be found in the above listed reports. Information from the above reports that was deemed relevant to fish and fish habitat has been reviewed and documented herein.

2.1 Document Review

Background information was obtained from the following sources:

- *Lake Simcoe Fish Community Objectives (2011);*
- *West Holland River Subwatershed Management Plan (LSRCA, 2010);*
- *The East Holland River Subwatershed Management Plan (LSRCA, 2010)*
- *Maskinonge River Subwatershed Plan (LSRCA, 2010)*
- *Innisfil Creek Subwatershed Health Check (NVCA, 2013)*
- MNRF's Make-a-Map: Natural Heritage Areas application (NHIC, 2019);
- Land Information Ontario (LIO, 2019);
- MNRF Fish ON-Line (MNRF, 2019);
- Correspondence with the MNRF Midhurst and Aurora District Offices (Response received on December 11th, 2019 and December 16th, 2019 respectively);
- Fisheries and Oceans Canada (DFO) Species at Risk (SAR) On-line mapping (DFO, 2019);
- Correspondence with Nottawasaga Valley Conservation Authority (NVCA) (Information request has been submitted);
- Correspondence with Lake Simcoe Region Conservation Authority (LSRCA) (Response received on December 10th, 2019);
- Correspondence with the MECP Species at Risk Branch (Response received on January 13, 2020)
- Ontario Freshwater Fishes Life History on-line database (Eakins, 2016); and,
- Aerial photography.

Information request letters were submitted on December 4, 2019 to the Midhurst and Aurora District offices of the MNRF, the Lake Simcoe Region Conservation Authority (LSRCA), the Nottawasaga Valley Conservation Authority (NVCA) and the MECP to obtain/confirm fisheries data associated with the identified watercourses (**Table 1**). The information request included the following: watercourse names and crossing locations, watercourse classifications, habitat information/location, fish community data, absence/presence of any vulnerable species and/or critical habitat, in-water work timing window, MNRF management objectives, groundwater discharge areas and benthic invertebrate data. A similar request was submitted to the MECP with regards to confirming the absence of any aquatic SAR records within the Study Area. No correspondence with DFO at this stage of the project has been completed; however, DFO's online aquatic SAR mapping has been reviewed.

3. Existing Conditions

Fish Habitat, as defined by the *Fisheries Act*, are spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes. Fish Habitats are those associated with aquatic features including, but not limited to, lakes, rivers, streams, road side and agricultural drains, online ponds and some wetlands. Using GIS data retrieved from LIO and aerial imagery, a mapping exercise identified 28 watercourses (river, streams and roadside/ agricultural drains) that the Recommended Plan will cross, five (5) waterbodies that exist within the RoW of the Recommended Plan and three (3) waterbodies that are within the Study Area. The location of all aquatic features present in the Study Area can be reviewed in **Appendix B**.

3.1 Watersheds

The Study Area falls within two (2) watersheds, the Nottawasaga Valley Watershed and the Lake Simcoe Watershed. Within the Nottawasaga Watershed, there is one (1) subwatershed that intersects with the Study Area; Innisfil Creek Subwatershed. Penville Creek (WC-01) is the only applicable watercourse within the Innisfil Subwatershed. Three (3) subwatersheds within the Lake Simcoe Watershed cover the rest of the Study Area; the West Holland River Subwatershed, the East Holland River Subwatershed and the Maskinonge River Subwatershed.

3.1.1 Innisfil Creek Subwatershed (WC-01)

The Innisfil Creek Subwatershed consists of four (4) main creek systems, Innisfil Creek, Bailey Creek, Beeton Creek and Penville Creek, that drain the southeast portion of the Nottawasaga River watershed (NVCA, 2013). Headwaters of Penville Creek begin just south of Bond Head and flow north through agricultural lands before entering Innisfil Creek north of Newton Robinson. Surface water quality and stream habitat in the Innisfil Creek Subwatershed is poor compared to the rest of the Nottawasaga River watershed (NVCA, 2013). Penville Creek has been identified as having 'below potential' or 'impaired' reaches throughout its course. The NVCA (2013) identify stream health of Penville Creek as being largely influenced by a lack of natural land cover and the dominance of intensive agricultural land use. The headwaters of Penville Creek support coolwater habitat, however downstream of the 6th Line (approximately 2 km south of the Recommended Plan the NVCA characterize Penville Creek as warmwater due to lack of riparian vegetation (NVCA, 2013).

3.1.2 West Holland River Subwatershed (WC-02 to WC-08)

The subwatershed is drained by the West Holland River, which flows in a northeast direction and drains into Cook's Bay (Lake Simcoe). The main tributaries of the West Holland River include: Ansnorveldt Creek, Glenville Creek, East Kettleby Creek, 400 Creek, Pottageville Creek, South Schomberg River, North Schomberg River, Fraser Creek, Scanlon Creek, William Neeley Creek, Coulson's Creek and the Holland Marsh and its extensive canal and Municipal Drain system (LSRCA, 2010). The headwaters originate from discharge springs and seepages along the northern parts of the Oak Ridges Moraine (LSRCA, 2010); however tributaries to the West Holland River that do not originate on the Oak Ridges Moraine, like Fraser Creek, have different characteristics such as temperature regime and substrate, and thus fish community assemblages may differ to other Holland River Tributaries (LRSCA, 2010).

This Subwatershed has a large range of thermal regimes, from cold headwater communities to diverse, warm, large order systems (LRSCA, 2010). Applicable to the watercourses found in the Study Area, the main branch of the

West Holland River from the mouth to Highway 9 is considered warmwater habitat; this includes Eastern, Western and Holland Landing Creeks and all municipal and agricultural drainage systems (LRSCA, 2010). However, Fraser Creek and many of its tributaries, closer to the subwatersheds' western boundaries, are considered cold/cool water habitat. In the West Holland River, many watercourses have been channelized to accommodate agricultural development, especially in the Fraser Creek and direct tributaries of the Holland Marsh; many of these systems are recognized Municipal drains (LSRCA, 2010).

3.1.3 East Holland River Subwatershed (WC-09 to WC-27)

The subwatershed is drained by the East Holland River, which flows generally in a northerly direction and drains into Cook's Bay (Lake Simcoe). The main branches of the East Holland River include the Main Branch, flowing westward from a point west of Musselman's Lake; the Aurora Branch; Wesley Corners Creek; and Bogart Creek (LRSCA, 2010). The Main Branch and the Aurora Branch join north of the Town of Aurora to form the East Holland River, and continue to flow north to discharge into Cook's Bay (LSRCA, 2010). This subwatershed also has a significant number of ephemeral watercourses that dry up during the summer seasons (LRSCA, 2010).

Like the West Holland Subwatershed, the East Holland Subwatershed has a large range of thermal regimes, contains cold to coolwater tributaries feeding a warmwater Main Branch and many watercourses have been channelized to accommodate agricultural development (many that are recognized as Municipal Drains) (LSRCA, 2010). Applicable to the watercourse found in the Study Area, the main branch of the East Holland River from the mouth to Lloydtown Aurora Road/ St. John's Sideroad West (approximately 5 km south of Highway 9) is considered warmwater habitat (LRSCA, 2010). As noted above, the warmwater habitat applies to the Western, Eastern and Holland Landing Creeks and all municipal and agricultural drainage systems.

3.1.4 Maskinonge River Subwatershed (WC-28)

Tributaries of the Maskinonge River begin in agricultural areas in the eastern half of the subwatershed and flow westward towards Lake Simcoe. The Maskinonge River is the only named stream in the subwatershed. The Maskinonge ranges from cold headwater communities influenced by the Oak Ridges Moraine in the south of the watershed to diverse, warm, large order systems (LRSCA, 2010). The Maskinonge River's northern and main Branches (closer to Lake Simcoe) are classified warmwater habitat, however the more southern tributaries (i.e., within Study Area) are classified as cold to coolwater (LRSCA, 2010). Geographically, this Subwatershed exists in a small portion of the Oak Ridges Moraine, limiting the amount of its tributaries influenced by groundwater and thus coldwater habitat is rare. Land use in the subwatershed is dominated by agricultural with natural area interspersed throughout (LRSCA, 2010).

3.2 Watercourse Crossings

Habitat conditions described within this section of the report are based on the *Bradford Bypass Fisheries Report – 2001- Ministry of Transportation* (AMEC, 2002) and the *Natural Environment and Agricultural Biophysical Assessment: 400 – 404 Extension Link* (McCormick Rankin Corporation, 1997) (Appendix G to the 1997 EA).

3.2.1 Watercourse Crossing 1 (WC-01): Tributary to Penville Creek

Review of aerial imagery indicate that this watercourse crosses the Recommended Plan's interchange to the Highway 400 at several locations. From the 9th Line, the watercourse flows south parallel to Highway 400 for approximately 325 m, then crosses southwest under Highway 400 and continues as a straightened channel through agricultural land west of Highway 400. This tributary joins with Penville Creek approximately 5 km west of Highway 400 (AMEC, 2002).

The 1997 EA characterized this watercourse as having a narrow channel and a riffle/run morphology with slightly wider pool sections that measured up to 1.0 m across. Substrates were identified as being dominated by cobble and gravel, with some incised riffle sections and exposed clay shelves. It was noted that the banks of the creek were stable and well vegetated; however, vegetative cover and stream shading were lacking throughout most of the assessed reaches. The 1997 EA identified this watercourse as fish habitat.

The Fisheries Report (AMEC, 2002) states that flow from this tributary was conveyed under Highway 400 via a concrete box culvert. WC-01 is further described as having a riffle/pool morphology upstream of the Recommended Plan and a historically straightened, wider, slow flowing channel downstream of the Recommended Plan. Substrates were largely sand, and gravel mixed with deposits of silt and muck (AMEC, 2002). Groundwater seeps were observed in the upstream reach; however, they were noted to be dry during summer investigations (AMEC, 2002). Upstream riparian vegetation was reported to be dominated by grasses and herbaceous species with the occasional shrub and isolated trees. Downstream riparian vegetation was identified as being dominated by similar species with a much narrower buffer between the watercourse and the adjacent agricultural fields. Bank stability was generally reported to be stable with fewer stable areas upstream of the Recommended Plan. An impediment to fish migration (under most flow conditions) was noted downstream of the Recommended Plan (AMEC, 2002). Recorded water temperatures and fish community were identified to be indicative of a warmwater thermal regime (AMEC, 2002). During the 2001 field investigations, there were no observations of White Sucker and Northern Pike spawning activity or habitat; additionally, no unique or critical habitat was recorded (AMEC, 2002).

MNRF (2019) correspondence identifies this watercourse as having a cool/ cold thermal regime (based on fish community assemblage) (see **Table 2** below for fish community). Rainbow Trout (*Oncorhynchus mykiss*) is a species of note in this subwatershed. Presence of this species and the cool/ coldwater habitat may classify this watercourse as Specialized Habitat and may affect the applicability of certain MTO BMPs. Please refer to **Section 4** for details.

3.2.2 Watercourse Crossing 2 (WC-02): Fraser Creek

Review of aerial imagery identifies this watercourse originating north of the 10th Line and flowing southwest to 9th Line and through a forested area. The watercourse continues south across the Recommended Plan and towards its confluence with WC-03 approximately 200 m south of the Recommended Plan, but still within the Study Area. The main stem of this creek drains into the West Holland River approximately 8 km south of the Study Area.

The 1997 EA characterizes this watercourse as having extremely low water depths, dominated by a gravel and cobble substrates with riffle zones and a shallow pool morphology. The 1997 EA notes that the banks within the wooded riparian zone lacked understory vegetation and had become susceptible to severe erosion. However, it was noted that due to the pasture activities downstream of the Recommended Plan, slumping banks and a widened, shallower and slower flowing channel was observed. The 1997 EA identified this watercourse as fish habitat and notes anecdotal evidence that the watercourse may attract migrant Northern Pike (*Esox Lucius*) and White Sucker (*Catostomus commersonii*).

The Fisheries Report (AMEC, 2002), stated that the morphology of this stream was dominated by shallow pools/flats and; in a smaller representation, riffle/ run morphology. Substrate was recorded to be predominantly gravel and sand which increasing amounts fines and silt substrates displayed downstream. Upstream riparian area was described as densely forested and instream woody debris was observed throughout. Downstream riparian areas were described as meadow/ agricultural lands with little to no instream shading or instream cover (AMEC, 2002). Recorded water temperatures were indicative of a warmwater thermal regime; however, fish community assemblage include both warm and cool water fish species (AMEC, 2002). White Sucker nursery habitat was observed and Brook Stickleback (in spawning colors) were collected during the 2001 fish collections. Anecdotal (Land Owner) evidence of Northern Pike use in the spring months was reported to field staff (AMEC, 2002).

MNRF (2019) identifies this watercourse as warmwater direct fish habitat that supports a diverse assemblage of many warmwater and some coolwater fish species (see **Table 2** below for fish community).

3.2.3 Watercourse Crossing 3 (WC-03): Tributary to Fraser Creek

Review of aerial imagery identifies this watercourse as beginning just south of 9th Line and 10 Sideroad intersection flowing south though the Study Area to where it converges with WC-02: Fraser Creek.

The 1997 EA describes this watercourse as a small incised channel that conveys an intermittent flow through a reed canary grass meadow. It further describes the channel as meandering through a small hardwood woodlot (at the intersection of 9th Line and 10 Sideroad) and then continues westerly along a narrow riparian strip. It is noted that the watercourse eventually joins the main branch of Fraser Creek (WC-02) in a cattle pasture. Where it was identified to cross the Recommended Plan, the flow was described as slow and shallow within a pool and minor gravel riffle morphology. Watercourse banks were recorded as stable and well-vegetated. No fish were observed.

The Fisheries Report (AMEC, 2002), stated that flows were conveyed through multiple channels within a grass and sedge dominated floodplain. Morphology was described as being dominated by extensive shallow run habitat, with small vertical drops into shorter flat sections (AMEC, 2002). Substrates were recorded as gravel/ sand and/ or clay muck compositions. Upstream riparian vegetation is described as sparse with some willow trees, within the Recommended Plan as a mature deciduous forest and downstream as a narrow buffer of grasses and herbaceous species between the watercourse and the adjacent agricultural lands (AMEC, 2002). Recorded water temperatures were indicative of a warmwater thermal regime however fish community assemblage include both warm and cool water fish species. No unique or critical habitats were identified (AMEC, 2002).

Desktop review, including review of LSRCA mapping and aerial imagery, shows this watercourse as a permanent system. MNRF (2019) correspondence identifies this watercourse as having a warmwater thermal regime (based on fish community assemblage) (see **Table 2** below for fish community).

3.2.4 Watercourse Crossing 4 and 5 (WC-04 and WC-05): Tributaries to Fraser Creek

Review of aerial imagery indicates these watercourses originate at an unevaluated wetland within a wooded area just north of the Recommended Plan within the Study Area. WC-04 drains into WC-05 within the Study Area but south of the Recommended Plan. WC-05 continues south, ultimately flowing into WC-02 Fraser Creek.

The 1997 EA describes WC-04 and WC-05 as one feature described as a swamp dominated by White Cedar (*Thuja occidentalis*) with a shallow swale depression that conveys ephemeral drainage. Flow was observed to be conveyed to an agricultural drain that flows south to 8th Line. Water was not present in the swale during the 1996 field reconnaissance. Fish were observed in the agricultural drain; however, it was noted that the elevation difference between the swale and the drain may create a seasonal barrier.

The Fisheries Report (AMEC, 2002), did not identify WC-04 as a watercourse that crosses the Recommended Plan. However, it was noted as an ephemeral feature linking WB-02 to WB-03 and as an ephemeral swale to the White Cedar Swamp tributary (WC-05). WC-04 was reported to be dry and cultivated during the spring and summer investigations and as not providing fish habitat (AMEC, 2002). Like the 1997 EA, WC-05 is identified within the Fisheries Report (AMEC, 2002) as a White Cedar Swamp. The Fisheries Report (AMEC, 2002) describes the swamp as the origin of the small tributary (WC-05) and as having shallow discontinuous flow that would not support fish habitat.

MNRF (2019) correspondence identifies the thermal regime of these watercourses as a warmwater thermal regime (based on fish community assemblage) (see **Table 2** below for fish community).

3.2.5 Watercourse Crossing 6 and 7 (WC-06 and WC-07): Tributaries to West Holland River

Review of aerial imagery identifies WC-07 as originating from an urban area just southwest of the Barrie Street and Line 8 intersection. WC-06 drains into WC-07 approximately 300 m south of the Recommended Plan and WC-07 continues to flow north to where it runs parallel (within the RoW) with the Recommended Plan, then appears to become channelized flowing directly south and then east through the Holland March Provincially Significant Wetland (PSW) ultimately draining into the West Holland River.

The 1997 EA describes these watercourses as cultivated seasonal drainage that do not constitute fish habitat. There is an additional record of WC-07 within the 1997 EA where it crosses Barrie Street/ Young Street. Named the 'Highway 11 Drain' in the 1997 EA, it is described as a seasonal drainage marked by a narrow cattail swale through cropland and is identified as not supporting fish habitat.

The Fisheries Report (AMEC, 2002), describes WC-06 as ephemeral drainage swales that do not support fish habitat due to being dry during both spring and summer investigations. WC-07, identified as Highway 11 Drainage (upstream reach) and as Artesian Industrial Parkway Tributary (downstream reach), is described as ephemeral drainage where it crosses Highway 11 (Barrie Street/ Young Street) and as a permanent feature where it crosses Artesian Industrial Parkway. The downstream reach of WC-07 (where it crosses the Parkway) is described as having substrates were dominated by muck and organics with underlying areas of sand and gravel. The channel morphology was heavily influenced by beaver dams, which cause flooding and partial barrier to upstream fish passage. The Fisheries Report (AMEC, 2002) identified considerable groundwater inputs from the naturalized areas upstream and downstream of where the watercourse crosses the Parkway. Recorded water temperatures were cooler than most of the surrounding watercourses due to the groundwater inputs. Although the water temperatures were indicative of coldwater habitat, the diverse fish community was represented by warm/cool water species (AMEC, 2002).

MNRF (2019) correspondence identifies the thermal regime of these watercourses as warmwater (based on temperature data and fish community assemblage) (see **Table 2** below for fish community).

3.2.6 Watercourse Crossing 8 (WC-08): West Holland River (Holland River West Branch)

Review of aerial imagery and LSRCA documents identifies WC-08 as a large river that flows in a northeast direction to where it drains into the Main Branch of the Holland River and eventually into Cook's Bay (Lake Simcoe). Where the Recommended Plan crosses the watercourse, the river is approximately 100 m wide and has a large forested floodplain that transitions into a wetland to the west, and a smaller fragment of wetland followed by agricultural lands to the east.

The 1997 EA describes the river as having an extremely slow flow. The 1997 EA characterizes the west side of the river as a low-level floodplain shrub and forest zone and a wide cattail marsh zone and the east side as a narrow band of cattail. Algal blooms caused by nutrient enrichment from agricultural runoff obscured substrate conditions; however, substrates were estimated to be dominated by silt, with some instream cover (i.e., large woody debris). Banks were noted to be stable and have thick vegetative growth; no signs of erosion were recorded. No shore cover was noted on either side of the river. The 1997 EA suggests that the river supports a diverse assemblage of warmwater sport and baitfish and that it serves as a migratory corridor for warmwater spawning fish. The 1997 EA also notes that the river is highly utilized by Northern Pike as spawning and nursery habitat.

The Fisheries Report (AMEC, 2002), describes the West Holland River as wide channel (+100 m) with a large floodplain of consisting of wetland and agriculture lands. The morphology was flat with soft organic substrates with aquatic vegetation existing primarily along the river margins. No fish collections were taken as part of the 2001 field

investigations (AMEC, 2002) as sufficient fish community information was available through secondary sources. Due to the turbidity of the water, assessments of spawning could not be completed (AMEC, 2002); however, the report identified that the West Holland River provides many types of habitat to a diverse fish community at various life stages and identified this watercourse as a migratory corridor to upstream spawning and nursery habitat.

MNRF (2019) identifies this watercourse as direct fish habitat that supports a diverse assemblage of many warmwater fish species (see **Table 2** below for fish community). Northern Pike is a species of note and the presence of this species and the possibility of appropriate spawning habitat (i.e., shallow, slow moving water, areas that flood only in the spring and early summer, highly vegetated) may classify this watercourse as ‘Specialized’ habitat. Specialized habitats are those used for spawning, nursery (e.g. slower moving areas with instream cover) or overwintering (e.g. pools). The classification of ‘Specialized’ habitat may affect the applicability of certain MTO BMPs. Please refer to **Section 4** for details.

3.2.7 Watercourse Crossing 9 to 20 (WC-09 to WC-20): West Holland River Tributary and Unnamed Drains

Review of aerial imagery shows an extensive drainage network that spans the approximate 1.3 km width between the West Holland River and Bathurst Street.

The 1997 EA describes these watercourses as field and field edge drainage ditches designed to lower water levels in the agricultural fields and permit muck farming activities. It recognizes that, due to the proximity of the West Holland River, many of the drains will provide seasonal spawning or migratory habitat.

Watercourse crossings 9 to 20 were not identified in the Fisheries Report (AMEC, 2002).

LIO data identifies all watercourses (not including WC-20) as warmwater system and as direct fish habitat that supports a diverse assemblage of many warmwater fish species (see **Table 2** below for fish community).

3.2.8 Watercourse Crossing 21 (WC-21): East Holland River (Holland River East Branch)

Review of aerial imagery and LSRCA documents identifies WC-21 as a large river that flows in a northwest direction to converge with the Main Branch of the Holland River and eventually drain into Cook’s Bay (Lake Simcoe). Where the Recommended Plan crosses, the river is approximately 130 m wide and has a large marina on the west bank and the Silver Lakes Golf Course on the east bank.

The 1997 EA characterizes the west shoreline as having stable banks and a sandy littoral shelf that extends approximately 2 m out from the river bank. The east bank was characterized as having a cattail fringe riparian area (approx. 10-15 m width) before the Silver Lakes Golf Course. Substrates were estimated to be primarily silt, with some instream cover (i.e., large woody debris). The potential for Northern Pike spawning habitat and nursery was identified in the cattail and rush communities along the east river shoreline.

The Fisheries Report (AMEC, 2002) describes the East Holland River as wide channel (60 m to 80 m) with a large floodplain consisting of aquatic grasses, cattails and wetland shrub species. Within the floodplain downstream of the Recommended Plan RoW, the Fisheries Report (AMEC, 2002) noted that the left bank of the river had been developed into a marina and the right bank had been developed into a golf course. Occurrences of fish were observed and/ or collected at the Silver Lakes Golf Course and Marina during the 2001 field investigations. Natural floodplain areas upstream were identified as providing potential spawning habitat for Northern Pike and Carp (AMEC, 2002). The morphology was described as flat with soft organic substrates with aquatic vegetation existing primarily along the river margins (AMEC, 2002). No fish collections were completed as part of the 2001 field

investigations due to the availability of secondary sourced fish community information. Due to the turbidity of the water, assessments of spawning could not be completed. However, the Fisheries Report (AMEC, 2002) recognized that, although not observed during their 2001 field investigations, the East Holland River provides many types of habitat to a diverse community of warm/cool water fish at various life stages and emphasised that this watercourse is a valuable migratory corridor to upstream spawning and nursery habitat.

Desktop review, including review of LSRCA mapping, LSRCA referenced reports and review of aerial imagery, identifies this river as a permanent system with a warmwater thermal regime. LIO data identifies this watercourse as supporting direct fish habitat with a diverse assemblage of many warmwater fish species (see **Table 2** below for fish community). Northern Pike is a species of note. The presence of this species and the possibility of appropriate spawning habitat (i.e., shallow, slow moving water, areas that flood only in the spring and early summer, highly vegetated) may classify this watercourse as 'Specialized' habitat. Specialized habitats are those used for spawning, nursery (e.g. slower moving areas with instream cover) or overwintering (e.g. pools). The classification of 'Specialized' habitat may affect the applicability of certain MTO BMPs. Please refer to **Section 4** for details.

3.2.9 Watercourse Crossing 22 (WC-22): Holborn Drain

Review of aerial imagery identifies this watercourse as originating just north of Queensville Side Road between a large wooded area at the edge of a large expanse of agricultural lands. Connected to a channelized drain north of the Study Area that runs west from the end of Holborn Road, WC-22 ultimately drains into the East Holland River. Within the Study Area, it appears that sections of the watercourse have been excavated to accommodate more water, thus creating two (2) online irrigation ponds.

The 1997 EA describes this watercourse as a drainage swale that conveys the seasonal runoff from a surrounding sod farm. The 1997 EA notes that reaches of the swale have been straightened and manipulated to improve drainage of the sod fields and the 1997 EA described the two (2) online ponds as wide depressions that support reed canary grass for most of the year. The 1997 EA also identifies the possibility for Northern Pike to migrate up the drain; however, utilization of the habitat was deemed unlikely due to the continuous disturbance from the sod farm (i.e., ditching, cultivation and disturbance in flow).

The Fisheries Report (AMEC, 2002), described this watercourse as an ephemeral feature that has been channelized and that is highly influenced by the two (2) online irrigation ponds. The channel was described as densely vegetated and the surrounding riparian vegetation was dominated by herbaceous species (upstream) and a forest community (downstream) of the Recommended Plan. Substrates were observed to be dominated by muck and organics. No fish collections were completed as part of the 2001 field investigations; however, AMEC (2002) reported anecdotal (Landowner) observations of carp stranded in the irrigation ponds, potentially indicating access from downstream habitats during high flow conditions; although, access may only be utilized for migration purposes.

LIO data identifies this watercourse as a warmwater system and as direct fish habitat that supports a diverse assemblage of many warmwater fish species (see **Table 2** below for fish community).

3.2.10 Watercourse Crossing 23 (WC-23): Ravenshoe/Boag Drain

Review of aerial imagery shows this watercourse as a channelized roadside ditch that runs parallel to 2nd Concession Road. The watercourse is channelized within the Study Area; however, it originates as a natural system southwest of the Queensville Sideroad and Leslie Street intersection. WC-23 continues north as roadside drainage along 2nd Concession Road past the end of the road and into the Holland River Marsh and eventually draining into the East Holland River.

There is no documentation of this watercourse in the 1997 EA or in the 2001 Fisheries Report (AMEC, 2002).

LIO data identifies this watercourse as a warmwater system and as direct fish habitat that supports a diverse assemblage of many warmwater fish species (see **Table 2** below for fish community).

3.2.11 Watercourse Crossings 24 to 27 (WC-24 to WC-27): Tributaries to Ravenshoe/Boag Drain

A review of aerial imagery shows a series of swales that cross the Study Area east and west of Leslie Street. All drainage from this area of Leslie Street eventually converges in the northeast quadrant of the Leslie Street and Holborn Road intersection (i.e., WC-25 and WC-26 drain into WC-27, and WC-24 and WC-27 drain into a semi-channelized agricultural drain that connects to WC-23).

The 1997 EA describes these watercourses as ephemeral, grass-lined waterways that have been impacted by agricultural activities. It describes the main drain that collects the flow of these swales as a widened, shallow channel that has been heavily impacted by grazing activity. It concludes that due to the seasonal variability in flow and degraded condition that these features do not support viable fish habitat.

The Fisheries Report (AMEC, 2002), describes these watercourses as agricultural drains that are ephemeral in nature. The swales were described as ranging from shallow channels to wide excavated channels that have been historically altered to provide enhanced drainage or by the construction of online ponds to store water for irrigation. Riparian vegetation was commonly a 2-10 m buffer dominated by emergent vegetation and herbaceous species. During the fish collection a warm/ coolwater fish community was identified; however, AMEC (2002), noted that access to many of the reaches were restricted in the summer months due to lack of flow. Online irrigation ponds were identified for WC-25, WC-26 and WC-27.

LIO identifies all these watercourses as warmwater systems and as direct fish habitat that supports a diverse assemblage of many warmwater fish species (see **Table 2** below for fish community).

3.2.12 Watercourse Crossing 28 (WC-28): Maskinonge River

Review of aerial imagery and LSRCA documents identifies this watercourse as a comparatively smaller river in width than that of the Holland River Branches. The river originates just south of the Highway 404 and Queensville Sideroad Intersection and flows northwest through the Maskinonge River Wetland Complex towards the larger branches of the Maskinonge River, eventually draining into Lake Simcoe.

The 1997 EA indicates that the river, where the Recommended Plan Highway 404 Interchange crosses, was altered/channelized in order to facilitate drainage. It further describes this reach of the river as a moderately-polluted, permanent warmwater stream with a shallow channel, stable and well-vegetated banks, silt dominated substrate with areas of gravel/cobble, and as having low instream and shore cover.

The Fisheries Report (AMEC, 2002) describes the Maskinonge River within the Study Area as highly altered and straightened; however, downstream of Holborne Road the river becomes more naturalized until its confluence with Lake Simcoe. The channel morphology is described as a riffle/run with sections of pool/flats (AMEC, 2002). Woody debris provided instream cover primarily in the downstream reach and undercut banks were identified throughout the investigated reaches (AMEC, 2002). Substrates were described as a mixture of sand, gravel and silty clay. Riparian vegetation was dominated by herbaceous species with small patches of mature willows on the downstream reach of the east bank (AMEC, 2002). Collected fish community consisted of warm/coolwater species. Summer water temperatures were not recorded.

LIO data identifies this watercourse as having a warmwater thermal regime. However, upon review of the Maskinonge River Subwatershed Plan (LRSCA, 2010), the more southern tributaries (i.e., within and near the Study Area) of this river are recognized as having cool to cold water temperatures and fish species. LIO data identifies this watercourse as direct fish habitat that supports a diverse assemblage of many warmwater fish species (see **Table 2** below for fish community).

3.3 Waterbodies

Eight (8) waterbodies (i.e., online and offline pond features) have been identified in the habitat conditions reported in the *Bradford Bypass Fisheries Report – 2001- Ministry of Transportation* (AMEC, 2002).

3.3.1 Fraser Creek Pond (WB-01)

Fraser Creek Pond (WB-01) is recorded in the Fisheries Report (AMEC, 2002) as an offline, privately-owned constructed Bass Pond located in proximity (20 m) to the main branch of the Fraser Creek (WC-02). Field investigations confirmed that the waterbody was not hydraulically connected to Fraser Creek; however, a cyprinid community was observed within the pond.

Review of aerial imagery and current mapping show this feature as approximately 200 m south of the Recommended Plan RoW.

3.3.2 Online Ponds to WC-04 (Tributary to Fraser Creek) (WB-02 and WB-03)

Two (2) online ponds to a Tributary to Fraser Creek (WC-04) were identified in the Fisheries Report (AMEC, 2002). WB-02 was identified as a former cattle pond that receives drainage from adjacent agricultural lands, and WC-03 was identified as a privately-owned Bass Pond. The AMEC report (2002) states that the ponds are connected by a poorly defined ephemeral swale (WC-04), which is connected to the White Cedar Swamp tributary to the east (WC-05). WB-02 was described as being covered in dense algae growth (during both spring and summer conditions) and therefore not supportive of conditions that are representative of fish habitat (AMEC, 2002). WB-03 was not investigated during the 2001 field investigations, likely due to a lack of access to the private property.

Review of aerial imagery depicts the WB-02 as within the Recommended Plan RoW and WB-03 as approximately 70 m north of the Recommended Plan. Current mapping shows these ponds are hydraulically connected and online to WC-04.

3.3.3 Silver Lakes Golf Course Ponds (WB-04)

The waterbodies associated with the Silver Lakes Golf Course have been cumulatively assigned the identification of WB-04. The Fisheries Report (AMEC, 2002) describes these features as a network of interconnected ponds that are used as water obstacles and irrigation water sources. The report states anecdotal (landowner) evidence that identified the ponds as groundwater-fed. It was also noted that an exchange of flow with the East Holland River through a 400-400 mm ridged plastic culvert at the 3rd hold pond (southwest corner of the Golf Course), providing fish access to the ponds during flood conditions (AMEC, 2002). Overall, AMEC (2002) confirmed that many of the ponds are hydraulically connected one other, to the East Holland River, and to the surrounding agricultural drains during periods of flooding. During the 2001 fish collections, all ponds, apart from one offline pond, were identified as fish habitat.

Review of aerial imagery and current mapping show that at least two (2) of the golf course ponds are within the Recommended Plan RoW.

3.3.4 Holborne Drain Irrigations Ponds (WB-05)

The Fisheries Report (AMEC, 2002) identifies these waterbodies as two (2) large online irrigation ponds that are hydraulically connect to one another and to WC-22. During spring investigations, the ponds were observed to have standing water; however, during the summer investigations the pond within the Recommended Plan RoW appeared to have been drained well below the inlet and outlet channel elevation, making it seasonally offline to WC-22. The larger of the ponds, the one that exists partially within the Recommended Plan RoW, was described as having very steep banks and a narrow aquatic macrophyte zone along the pond margins. No fish were caught during the 2001 fish collections. As noted above, these ponds are described as artificial waterbodies created for irrigation purposes and thus the ponds are heavily altered annually during each growing season. These alterations create seasonal impediments to fish movement; however, it is likely that the ponds and WC-22 are utilized by fish to migrate to upstream and downstream habitats during appropriate flows.

Review of aerial imagery and current mapping depicts the larger pond (immediately downstream of WC-22, north of the Recommended Plan) as being partially within the Recommended Plan RoW and the smaller pond as approximately 200 m north of the Recommended Plan.

3.3.5 Tributary to Ravenshoe/ Boag Drain Irrigation Ponds (WB-06, WB-07 and WB-08)

The Fisheries Report (AMEC, 2002) describes all identified waterbodies (WB-06, WB-07 and WB-08) as constructed online irrigation ponds. WC-06 is further described as having dry conditions during the spring and summer investigation. Upon review of aerial imagery and current mapping, WB-06 is online to WC-25, and is entirely within the Recommended Plan RoW. Field investigations were not completed at WB-07; however, it was identified in the Fisheries Report (AMEC, 2002) as being a permanent feature and being online to WC-26. Upon review of aerial imagery and current mapping, WB-07 is approximately 200 m south of the Recommended Plan RoW. The Fisheries Report (AMEC, 2002) describes WC-08 as a permanent feature. Fish collections were completed at WB-08 and are reported in **Table 2** below. Upon review of aerial imagery and current mapping, half of WB-08 (approximately 130 m in length) is in the Recommended Plan RoW.

3.4 Fish Community Summary

Sufficient information was available from the LIO data, via MNRFC correspondence and from previous reports to characterize the fish community within the Study Area. **Table 2** summarizes the existing fish community assemblage at each watercourse based on Template D2 of the Guide. **Table 2** below identifies potential Specialized, Limiting or Rare Habitat within the Study. This language reflects MTO's response to the 2019 *Fisheries Act* Amendments and the updates that are being made to the Guide and associated templates.

3.4.1 Aquatic SAR

As noted in **Section 1.1.1**, MECP identified an occurrence of American Eel, recorded in 2011, within the Holland River (i.e., West Holland River) north of the Study Area. American Eel is a fish species listed as Endangered as per the provincial ESA (2007); however, it has no status or schedule as per the federal SARA (2002) and is therefore afforded only provincial protection. MECP also stated that they do not expect surveys for American Eel to be undertaken in future design stages; however, habitat for this species should be considered during any future field programs. No other records of aquatic SAR were identified within the Study Area upon review of the resources listed in Section 2, including DFO's online aquatic SAR mapping tool.

Table 2. Existing Fish and Fish Habitat Conditions Summary Table (Template D2)

Waterbody	Work Location (UTM Coordinates)	Flow	Thermal Regime	Fish Habitat ¹	Habitat Information (substrate type, vegetation etc.) ²	Fish Species Present	Constraints and Opportunity	Specialized, Limiting or Rare Fish Habitat Features ³	SAR present	In-water timing windows for construction
WC-01: Tributary to Penville Creek	609218, 4885909	NVCA (2013): Permanent	MNRF (2019): Coolwater	LIO (2019) and EA (1997): Direct	AMEC (2002): riffle/pool morphology upstream, wide straightened, slow flowing channel downstream. Substrates dominated by sand, and gravel with deposits of silt and muck. Groundwater seeps were observed. Upstream riparian vegetation dominated by grasses and herbaceous species with the occasional shrub and isolated trees. Downstream riparian vegetation dominated by similar species with a much narrower buffer between the watercourse and the adjacent agricultural fields.	LIO (2019): Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.	AMEC (2002): An impediment to fish migration (under most flow conditions) was noted downstream of the Recommended Plan (AMEC, 2002).	May be classified as Specialized Habitat: Cold water streams that contain Rainbow Trout. Habitat in its natural condition or only slightly degraded relative to the function that it supports.	None	MNRF (2019): July 15 to March 15
WC-02: Fraser Creek	609930, 4886069	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): Channel morphology was dominated by shallow pools/ flats and; in a smaller representation, riffle/ run morphology. Substrate were predominantly gravel and sand with fines and silt substrates downstream. Upstream riparian was densely forested, and instream woody debris was observed throughout. Downstream riparian areas were dominated by meadow/ agricultural lands with little to no instream shading or instream cover.	LIO (2019) and LSRCA (2003): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fathead Minnow, Golden Shiner, Goldfish, Hornyhead Chub, Johnny Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Smallmouth Bass, White Sucker and Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WB-01: Fraser Creek Pond	610069, 4885842	To be determined upon field investigations during Preliminary Design. Feature	Not Applicable (Offline)	AMEC (2002): Direct	AMEC (2002): An offline, privately-owned constructed Bass Pond close to main branch of the Fraser Creek (WC-02).	AMEC (2002): Largemouth Bass, Cyprinids	Not Applicable	Not Applicable	None	Not Applicable (Offline)
WC-03: Tributary to Fraser Creek	610547, 4886272	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): multiple channels within a grass and sedge dominated floodplain. Morphology was dominated by extensive shallow run habitat, with small vertical drops into shorter flat sections. Substrates were dominated by gravel/ sand and/ or clay muck compositions. Upstream riparian vegetation was sparse with some willow trees, and mature deciduous forest and downstream as a narrow buffer of grasses and herbaceous species between the watercourse and the adjacent agricultural lands.	LIO (2019) and LSRCA (2003): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WB-02: Online Pond to WC-04	610069, 4885842	To be determined upon field investigations during Preliminary Design.	Not Applicable	AMEC (2002): Not fish habitat	AMEC (2002): An online, former cattle pond that receives drainage from adjacent agricultural lands. Dense algae growth in spring and summer conditions. Origin of (online to) WC-04.	Not Applicable	Not Applicable	Not Applicable	None	Not Applicable
WB-03: Online Pond to WC-04	611634, 4886778	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater (Online to WC-04)	Unknown	Unknown	Unknown	Unknown	Unknown	None	MNRF (2019): July 15 to March 15 (Online to WC-04)
WC-04: Tributary to Fraser Creek	612791, 4886960	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): An ephemeral feature linking WB-02 to WB-03 and as an ephemeral swale to the White Cedar Swamp tributary (WC-05). WC-04 was reported to be dry and cultivated during the spring and summer investigations.	LIO (2019): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15

Waterbody	Work Location (UTM Coordinates)	Flow	Thermal Regime	Fish Habitat ¹	Habitat Information (substrate type, vegetation etc.) ²	Fish Species Present	Constraints and Opportunity	Specialized, Limiting or Rare Fish Habitat Features ³	SAR present	In-water timing windows for construction
WC-05: Tributary to Fraser Creek	613197, 4887078	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): White Cedar Swamp that a small tributary originates from. It is described as having shallow discontinuous flow.	LIO (2019): Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-06: Holland River Tributary	615116, 4887564	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): Field swale that drains agricultural land within the Study Area.	LIO (2019): Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker and Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-07: Holland River Tributary	615762, 4887454	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): Substrates dominated by muck and organics with underlying areas of sand and gravel. Channel morphology heavily influenced by beaver dams. Considerable groundwater inputs from the naturalized areas upstream and downstream were identified.	LIO (2019), LSRCA (2003) and AMEC (2002): Blacknose Dace, Brassy Minnow Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker and Yellow Perch.	To be determined upon field investigations during Preliminary Design.	Confirmed spawning habitat for muskellunge species (MNRF, 2019).	None	MNRF (2019): July 15 to March 1
WC-08: West Holland River	616323, 4887569	LSRCA (2010): Permanent	MNRF (2019) Warmwater	LIO (2019) and LSRCA (2010): Direct	AMEC (2002): A wide channel (+100 m) with a large floodplain of consisting of wetland and agriculture lands. The morphology was flat with soft organic substrates with aquatic vegetation existing primarily along the river margins. .	LIO (2019): Rock Bass, Brook Stickleback, Northern Pike, Johnny Darter/ Tessellated Darter, Pumpkinseed, Largemouth Bass, Emerald Shiner, Yellow Perch, Black Crappie, Walleye, Common Carp, Golden Shiner, Bluntnose Minnow and Spottail Shiner.	To be determined upon field investigations during Preliminary Design.	May be classified as Specialized Habitat: Migratory corridors fish require to reach high value upstream spawning habitat and specialized habitats that fish use for spawning, nursery (e.g. slower moving areas with instream cover). Confirmed spawning habitat for muskellunge species (MNRF, 2019).	None	MNRF (2019): July 15 to March 1
WC-09: Holland River Tributary	616421, 4887579	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	Confirmed spawning habitat for muskellunge species (MNRF, 2019).	None	MNRF (2019): July 15 to March 1
WC-10: Unnamed Drain	616752, 4887653	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15

Waterbody	Work Location (UTM Coordinates)	Flow	Thermal Regime	Fish Habitat ¹	Habitat Information (substrate type, vegetation etc.) ²	Fish Species Present	Constraints and Opportunity	Specialized, Limiting or Rare Fish Habitat Features ³	SAR present	In-water timing windows for construction
WC-11: Unnamed Drain	616797, 4887641	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-12: Unnamed Drain	616827, 4887700	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-13: Unnamed Drain	616879, 4887657	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-14: Unnamed Drain	616949, 4887722	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-15: Unnamed Drain	617035, 4887719	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-16: Unnamed Drain	617100, 4887710	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	Confirmed spawning habitat for muskellunge species (MNRF, 2019).	None	MNRF (2019): July 15 to March 1
WC-17: Unnamed Drain	617195, 4887766	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15

Waterbody	Work Location (UTM Coordinates)	Flow	Thermal Regime	Fish Habitat ¹	Habitat Information (substrate type, vegetation etc.) ²	Fish Species Present	Constraints and Opportunity	Specialized, Limiting or Rare Fish Habitat Features ³	SAR present	In-water timing windows for construction
						Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.				
WC-18: Unnamed Drain	617263, 4887804	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-19: Unnamed Drain (Extensive Drainage System)	617304, 4887800	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Field and field edge drainage ditches.	LIO (2019): Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-20: Unnamed Drain	617654, 4887836	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Unknown	LIO (2019): Unknown	EA (1997): Field and field edge drainage ditches.	LIO (2019): Unknown	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-21: East Holland River	618939, 4888106	LSRCA (2010): Permanent	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): A wide channel (60 m to 80 m) with a large floodplain consisting of aquatic grasses, cattails and wetland shrub species. Channel morphology was flat with soft organic substrates with aquatic vegetation existing primarily along the river margins.	LIO (2019): Brown Bullhead, Bowfin, Common Carp, Northern Pike, Pumpkinseed, Largemouth Bass, Golden Shiner, Spottail Shiner, Black Crappie, Rock Bass, Yellow Perch and Fathead Minnow	To be determined upon field investigations during Preliminary Design.	May be classified as Specialized Habitat: Migratory corridors fish require to reach high value upstream spawning habitat and specialized habitats that fish use for spawning, nursery (e.g. slower moving areas with instream cover). Confirmed spawning habitat for muskellunge species (MNRF, 2019).	None	MNRF (2019): July 15 to March 1
WB-04: Silver Lakes Golf Course Ponds	6192215, 4888519	To be determined upon field investigations during Preliminary Design.	Unknown	AMEC (2002): Direct	AMEC (2002): A network of interconnected ponds that are used as water obstacles and irrigation water sources as part of the Silver Lakes Golf Course. Hydraulically connected to surrounding fish habitat during flood conditions.	AMEC (2002): Largemouth Bass, Black Crappie, Pumpkinseed, Brown Bullhead, Common Carp, Fathead Minnow, Brook Stickleback and potentially other species found in East Holland River.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	Unknown
WC-22: Holborn Drain	620961, 4888719	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): Channelized with flows that are highly influenced by the online irrigation ponds. Densely vegetated channel. Riparian vegetation dominated by herbaceous species upstream and a forest community downstream. Substrates were recorded as muck and organics.	LIO (2019) and LSRCA (2003): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WB-05: Holborn Drain Irrigation Ponds	620961, 4888719	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater (Online to WC-22)	AMEC (2002) and LIO (2019): Direct (Online to WC-22)	AMEC (2002): Two (2) large online irrigation ponds that are hydraulically connect to one another and WC-22. The larger of the ponds, was described as having very steep banks and a narrow aquatic macrophyte zone along the pond margins. Ponds are heavily altered during the growing seasons.	LIO (2019) and LSRCA (2003): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15 (Online to WC-22)

Waterbody	Work Location (UTM Coordinates)	Flow	Thermal Regime	Fish Habitat ¹	Habitat Information (substrate type, vegetation etc.) ²	Fish Species Present	Constraints and Opportunity	Specialized, Limiting or Rare Fish Habitat Features ³	SAR present	In-water timing windows for construction
WC-23: Ravenshoe/Boag Drain	621711, 4889266	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	Unknown	LIO (2019) and LSRCA (2003): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-24: Tributary to Ravenshoe/Boag Drain	622946, 4889756	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	EA (1997): Ephemeral, grass-lined waterways that have been impacted by agricultural activities.	LIO (2019): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WC-25: Tributary to Ravenshoe/Boag Drain	623418, 4889926	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): Historically altered agricultural swales with riparian buffers (2-10 m) dominated by emergent vegetation and herbaceous species.	LIO (2019): Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WB-06: Tributary to Ravenshoe/Boag Drain Irrigation Ponds	623398, 4889840	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	Unknown	AMEC (2002): Dry Pond	Unknown	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15 (Online to WC-25)
WC-26: Tributary to Ravenshoe/Boag Drain	623672, 4889997	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): Historically altered agricultural swales with riparian buffers (2-10 m) dominated by emergent vegetation and herbaceous species.	LIO (2019) and AMEC (2002): Brown Bullhead, Brooke Stickleback, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WB-07: Tributary to Ravenshoe/Boag Drain Irrigation Ponds	623874, 4889636	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater (Online to WC-26)	LIO (2019): Direct (Online to WC-26)	Unknown	LIO (2019) and AMEC (2002): Brown Bullhead, Brooke Stickleback, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15 (Online to WC-26)
WC-27: Tributary to Ravenshoe/Boag Drain	623941, 4890096	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): Historically altered agricultural swales with riparian buffers (2-10 m) dominated by emergent vegetation and herbaceous species.	LIO (2019) and AMEC (2002): Brown Bullhead, Brooke Stickleback, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15
WB-08: Tributary to Ravenshoe/Boag Drain Irrigation Pond	623971, 4890102	To be determined upon field investigations during Preliminary Design.	MNRF (2019): Warmwater (Online to WC-27)	LIO (2019): Direct (Online to WC-27)	Unknown	LIO (2019) and AMEC (2002): Brown Bullhead, Brooke Stickleback, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	To be determined upon field investigations during Preliminary Design.	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15 (Online to WC-27)
WC-28: Maskinonge River	624846, 4890350	LSRCA (2010): Permanent	MNRF (2019): Warmwater	LIO (2019): Direct	AMEC (2002): Highly altered and straightened within Study Area. The channel morphology is described as a riffle/run with sections of pool/flats. Woody debris provided instream cover (downstream) and undercut banks were identified throughout the investigated	LIO (2019): Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Emerald Shiner,	EA (1997): The positioning of the Recommended Plan, Highway 404 interchange, will require	To be determined upon field investigations during Preliminary Design.	None	MNRF (2019): July 15 to March 15

Waterbody	Work Location (UTM Coordinates)	Flow	Thermal Regime	Fish Habitat ¹	Habitat Information (substrate type, vegetation etc.) ²	Fish Species Present	Constraints and Opportunity	Specialized, Limiting or Rare Fish Habitat Features ³	SAR present	In-water timing windows for construction
					reaches. Substrates were described as a mixture of sand, gravel and silty clay. Riparian vegetation was dominated by herbaceous species.	Etheostoma sp., Fathead Minnow, Golden Shiner, Hornyhead Chub, Johnny Darter, Johnny Darter/ Tesselated Darter, Largemouth Bass, Mimic Shiner, Mottled Sculpin, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Redfin Shiner, White Sucker and Yellow Perch.	a minor realignment of a previously channelized section of the tributary. The realignment may represent an opportunity to return the river channel to a more natural morphology and improve fish habitat			

- Note: 1. Fish habitat is defined in subsection 2(1) of the Fisheries Act to include all waters frequented by fish and any other areas upon which fish depend directly or indirectly to carry out their life processes. The types of areas that can directly or indirectly support life processes include, however are not limited to, the following: spawning grounds and nursery, rearing, food supply and migration areas.
2. It is important to note that all the habitat information in this table will need to be field verified as records are over 20 years old.
3. These designations are based on outdated habitat information and will need to be field verified.

4. Determination of Significance

Due to the proximity of the aquatic features in the Study Area to the West and East Holland River Branches, as well as connections to the Maskinonge River and Penville Creek, many of the identified aquatic features are either direct or indirect fish habitat as regulated under the *Fisheries Act*. Therefore, design of the Bradford Bypass will be subject to assessment under the MTO/DFO/MNRF Fisheries Protocol to determine the likelihood that the project may result in HADD of fish habitat.

Spawning habitat (i.e., shallow, slow moving water, areas that flood only in the spring and early summer, highly vegetated) for Northern Pike is likely present in several watercourses throughout the Study Area. This may classify many of the watercourses as Specialized Habitat. Specialized Habitat includes habitats that are used for spawning, nursery (e.g. slower moving areas with instream cover) or overwintering (e.g. pools) (MTO BMP Manual - Version 2.3, 2018).

Both West Holland River (WC-08) and East Holland River (WC-21) are well-documented to be migratory corridors for many warmwater species and provide access to high-value upstream spawning habitat. Migratory corridors are considered Specialized Habitat.

MNRF (2019) confirmed that the Tributary to Penville Creek (WC-01) supports a cool/coldwater thermal regime based on fish community assemblage. The combination of a cool/cold water thermal regime and records of Rainbow Trout would classify this watercourse as Specialized Habitat.

As noted in **Section 1.1.2**, MTO projects adhere to the guidelines in the MTO/DFO/MNRF Fisheries Protocol, including application of MTO's BMPs during fish and fish habitat impact assessments. If a watercourse contains Specialized Habitat, certain aspects of a proposed activity cannot take place (i.e., replacement of rock reinforcement below the High-Water Mark [HWM] during Bridge Maintenance activities) under a BMP but instead require comprehensive fisheries assessment.

5. Limitations of the Report

The findings of this report were limited to a review of desktop and secondary source data. Field investigations were not completed as part of the review process. AECOM utilized the most recent data available (refer to **Section 2**) to gain an overall understanding of the existing conditions within the Study Area. However, data gaps exist within the background review documents and current data is not always available when using secondary sources. As such, the presence of up-to-date habitat information/ conditions (substrate type, vegetation etc.), flow regime and other detailed information for the identified aquatic features within the Study Area could not be confirmed and is referenced from the previous EA (1997) and the Fisheries Report (AMEC, 2002). AECOM has used its best professional judgement to summarize and interpret the results of the desktop review and provide accurate conclusions.

6. Recommendations

A comprehensive Fisheries Assessment is typically supported by field investigations; therefore, it is recommended that the information regarding fish and fish habitat provided within this report be supplemented with field investigations conducted in accordance with the MTO Environmental Guide for Fish and Fish Habitat (MTO, 2009) during the Preliminary Design phase.

Outdated habitat information (flow regime, substrate type, riparian and in-stream habitat, barriers to fish movement etc.) and any related constraints and opportunities that may exist at and/ or near the identified aquatic features have been identified as the key data gaps within this report. Additionally, the Study Area is largely within an area of dynamic agriculturally-dominant land use and thus there is an extensive network of field and field edge drainage ditches designed to lower water levels in the surrounding agricultural fields. These drainage ditches and flow conveyance features can potentially contain or support fish habitat but may periodically change configuration through regular farming and maintenance practices. Field investigations would close any identified data gaps, including the identification of aquatic features that have not been acknowledged as part of EA (1997), within the Fisheries Report (AMEC, 2002) and upon the review of current LIO (2019) data. During future design phases and field programs, any recorded/ identified field data that does not align with MNRF data, will be communicated to MNRF to discuss any changes in order to provide the appropriate categorization of the watercourse.

Due to the records for Northern Pike throughout the Study Area, updated habitat information will be required to confirm if Specialized Habitat, such as habitats that are used for spawning, nursery (e.g. slower moving areas with instream cover) or overwintering (e.g. pools), is present.

The MECP identified an occurrence of American Eel, recorded in 2011, within the Holland River (i.e., West Holland River) north of the Study Area. The MECP stated that they do not expect surveys for American Eel to be undertaken in future design stages; however, habitat for this species should be considered during any future field programs. It is recommended that screening for SAR continues to be conducted as part of the Preliminary and Detailed Design phases of this project since species can be added to, or removed from, the scheduled list of protected species on a periodic basis.

7. Literature Cited

- AMEC Earth & Environmental Limited, 2002:
Bradford Bypass Fisheries Report -2001- Ministry of Transportation. Prepared for the Ministry of Transportation (MTO)
- Department of Fisheries and Oceans Canada (DFO), 2019:
Aquatic Species at Risk (SAR) Mapping. Online Application at: <https://www.dfo-mpo.gc.ca/species-especies/sara-lep/map-carte/index-eng.html>. Accessed November 2019.
- Eakins, R.J., 2016:
Ontario Freshwater Fishes Life History Database. Version 4.24. Online database. Available online at: <http://www.ontariofishes.ca>. Accessed November 2019.
- Google Canada. Google Earth, 2017:
<https://www.google.ca/earth/>. Online application. Accessed November 2019.
- Lake Simcoe Region Conservation Authority (LSRCA), 2010:
Maskinonge River Subwatershed Plan. Available online at: https://www.lsrca.on.ca/Shared%20Documents/reports/maskinonge_subwatershed_2010.pdf . Accessed November 2019.
- Lake Simcoe Conservation Authority (LSRCA), 2010:
East Holland River Subwatershed Management Plan. Available online at: <https://www.lsrca.on.ca/Shared%20Documents/reports/east-holland-subwatershed-plan.pdf>. Accessed November 2019.
- Lake Simcoe Region Conservation Authority (LSRCA), 2010:
West Holland River Subwatershed Management Plan. Available online at: <https://www.lsrca.on.ca/Shared%20Documents/reports/west-holland-subwatershed-plan.pdf>. Accessed November 2019.
- Nottawasaga Valley Conservation Authority (NVCA), 2013:
Innisfil Creek: 2013 Subwatershed Health Check. Available online at: <https://www.nvca.on.ca/Shared%20Documents/2013%20Innisfil%20Creek%20SWHC.pdf> Accessed November 2019.
- Ontario Ministry of Natural Resources and Forestry (MNRF), 2011:
Lake Simcoe Fisheries Community Objectives. Available online at: <https://www.ontario.ca/document/fish-community-objectives-lake-simcoe>.
- Ontario Ministry of Natural Resources and Forestry, 2016:
Natural Heritage Information Centre, Make a Natural Heritage Map. <https://www.ontario.ca/page/natural-heritage-information-centre>. Accessed November 2019.
- Ontario Ministry of Natural Resources and Forestry, 2019:
Fish ON-Line, online mapping application.
<https://www.gisapplication.lrc.gov.on.ca/FishONLine/Index.html?site=FishONLine&viewer=FishONLine&locale=en-US>. Accessed November 2019.

Ontario Ministry of Natural Resources and Forestry, 2019:

Land Information Ontario: Ontario GeoHub. <https://geohub.lio.gov.on.ca/>. Accessed November 2019.

Ontario Ministry of Transportation, 2000:

Class Environmental Assessment for Provincial Transportation Facilities.

Ontario Ministry of Transportation, 2009:

Environmental Guide for Fish and Fish Habitat. Queen's Printer of Ontario.

Ontario Ministry of Transportation, 2016:

MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings
Version 3 (Pilot), 2016

Appendix **A**

Aquatic Features Mapping (Figure 2.1 to Figure 2.5)

Appendix **B**

Correspondence with Regulatory Agencies

From: Eplett, Megan (MECP) <Megan.Eplett@ontario.ca>
Sent: Monday, January 13, 2020 2:34 PM
To: Minielly, Andrew <Andrew.Minielly@aecom.com>
Subject: RE: MNRF Aurora District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

Hello Andrew,

Thank you for your email regarding the Bradford Bypass (Highway 400 – 404 Link) and for reviewing and compiling available species at risk information.

I have screened the study area identified in the mapping you provided against **known** occurrences of endangered and threatened species and can confirm that the information you received from the NHIC data base.

The following species should be added to your list of potential species which should be considered if appropriate habitat is present within the study area:

Barn Swallow (THR)
Bobolink (THR)
Eastern Meadowlark (THR)
Bank Swallow (THR)
Bald Eagle (SC)
Peregrine Falcon (SC)
Least Bittern (THR)
Little Brown Myotis (END).
Northern Myotis (END)
Tri-coloured Bat (END)
Henslow's Sparrow (END)
Butternut (END)
American Eel (END)

As you are likely aware the species at risk records found in the NHIC database are not exhaustive and are based on **known** occurrences only. As a result, although there may be no record (or confirmation) of a species at risk on site it does not mean that they are not present if appropriate habitat exists. Due diligence is therefore still required and would include an appropriate consideration of what species could be present based on available habitat at the location noted above. Your field work should inform you on what species on the SARO list could possibly be encountered based on available habitats in the area of the study and the possible survey methodologies required during your site assessments.

Please note the above information pertains to species at risk only. For review and confirmation on natural heritage features and aquatic resources you will need to contact the MNRF Aurora District office.

Please continue to keep MECP informed as the Environmental Assessment progresses. Should you require further information or have any other questions please feel free to contact me.

Thank you,

Megan

**Megan Eplett | Management Biologist | Permissions and Compliance | Species at Risk Branch
| Ontario Ministry of Environment, Conservation and Parks
50 Bloomington Road, Aurora, Ontario, L4G 0L8 | Phone: 289-221-1794 |
Email: megan.eplett@ontario.ca**

From: Minielly, Andrew <Andrew.Minielly@aecom.com>

Sent: Wednesday, December 4, 2019 11:38 AM

To: ESA Aurora (MNRF) <ESA.Aurora@ontario.ca>

Cc: Piette, Jessica <Jessica.Piette@aecom.com>; Lohnes, Shelley <Shelley.Lohnes@aecom.com>; Ellis, Julie <Julie.Ellis@aecom.com>; Fowler, Devon <Devon.Fowler@aecom.com>; Easterling, Katie <katie.easterling@aecom.com>; Rankin, Sonia <sonia.rankin@aecom.com>; Fleming, Braden <Braden.Fleming@aecom.com>; Sarris, Larry (MTO) <Larry.Sarris@ontario.ca>; Gribbon, Rhonda (MTO) <Rhonda.Gribbon@ontario.ca>

Subject: MNRF Aurora District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

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Good morning,

AECOM has been retained by the Ministry of Transportation to undertake preparatory work for the re-initiation of the Bradford Bypass, which will be completed to a Preliminary Design level of detail. At this time, the preparatory work will include a desktop and secondary source data review. A request for information letter is attached. Figure 1 is attached and provides an overview of the Background Data Request Study Area.

AECOM would kindly like to request that the MNRF review the list of Natural Heritage, SOCC and aquatic resource records identified for the Study Area (Provided in Attachment 1) and confirm if there are any other records that should be considered for this project. Any data received by December 18th can be included in the first draft of our report, however data received after this date will be included in final drafts of the reports to be issued by February 1, 2020.

Thank you and please do not hesitate to contact me if you have any questions or concerns,

Andrew Minielly, (Hons) B.ES
Terrestrial Ecologist, Water & Natural Resources, Environment
D +1-519-650-8634
M +1-519-571-4109
andrew.minielly@aecom.com

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Kitchener, Ontario, N2P 0A4, Canada
T +1-519-650-5313

aecom.com

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Minielly, Andrew

From: Kate Lillie <K.Lillie@lsrca.on.ca>
Sent: Tuesday, December 10, 2019 11:01 AM
To: Minielly, Andrew
Cc: Shawn Filson; Darren Campbell
Subject: RE: LSRCA - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)-
Background Information Request
Attachments: BradfordBypass_DeerWintering.pdf

Hi Andrew,

Thanks for your email. Shawn forwarded your request for natural heritage information over to me to facilitate. In addition to the information you have acquired already, we would be able to provide the following:

Landcover mapping

This mapping includes ELC to the community series, but, as this mapping was largely completed via air photo interpretation, it would need to be ground-truthed.

We would be able to provide .pdf maps at no cost, but since it is such a large study area, you may want to have this information in GIS format. If .pdfs are acceptable, please let me know and I'll prepare those for you. But, if you require this in GIS format, please submit a request directly to our GIS Coordinator, Darren Campbell (d.campbell@lsrca.on.ca).

Aquatic monitoring data

There are several LSRCA monitoring stations within the study area. I've placed a request with our Aquatic Ecologist to review the fisheries data you've gathered so far. Any additional fisheries data will be provided once it has been compiled. We appreciate your patience as it can sometimes take several weeks to pull this information together depending on the volume of requests we receive.

Deer wintering areas

Please find attached a .pdf map that shows deer wintering areas. This data is owned and managed by MNRF. If you require it in GIS format, please request it directly from MNRF.

Natural Heritage System mapping

LSRCA recently completed natural heritage system mapping for the Lake Simcoe watershed as part of the Natural Heritage System & Restoration Strategy. The Strategy may contain information relevant to your project and can be accessed online here: <https://www.lsrca.on.ca/Shared%20Documents/reports/Natural-Heritage-Systems-Restoration-Strategy.pdf>

In particular, Fig. 4.15 is a map of the entire natural heritage system (last page of the strategy). Section 4.0 describes the various types of core features (wetland, woodland, etc.) and targeted areas that were mapped as part of the system. If you require this mapping in GIS format, please request this through our GIS Coordinator.

Subwatershed Plans

The study area spans three subwatersheds: West Holland, East Holland and Maskinonge. The Subwatershed Plans for each area may contain information relevant to your project.

West Holland River Subwatershed Plan: <https://www.lsrca.on.ca/Shared%20Documents/reports/west-holland-subwatershed-plan.pdf>

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Maskinonge River Subwatershed Plan:

https://www.lsrca.on.ca/Shared%20Documents/reports/maskinonge_subwatershed_2010.pdf

Please let me know if we can be of further assistance at this point.

Kind regards,

Kate Lillie, HBSc, EP, ISA
Natural Heritage Ecologist
Lake Simcoe Region Conservation Authority
120 Bayview Parkway,
Newmarket, Ontario L3Y 3W3
905-895-1281, ext. 286 | 1-800-465-0437
k.lillie@LSRCA.on.ca | www.LSRCA.on.ca

Twitter: @LSRCA

Facebook: LakeSimcoeConservation

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From: Minielly, Andrew [mailto:Andrew.Minielly@aecom.com]

Sent: December 4, 2019 11:37 AM

To: Shawn Filson

Cc: Piette, Jessica; Lohnes, Shelley; Ellis, Julie; Fowler, Devon; Easterling, Katie; Rankin, Sonia; Fleming, Braden; larry.sarris@ontario.ca; Rhonda.Gribbon@ontario.ca

Subject: LSRCA - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

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Good morning Mr. Filson,

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Fowler, Devon

From: Minielly, Andrew
Sent: December-12-19 3:04 PM
To: Fowler, Devon
Cc: Easterling, Katie; Lohnes, Shelley; Ellis, Julie; Piette, Jessica; Fleming, Braden
Subject: FW: LSRCA - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request
Attachments: EH35.xlsx; WH05.xlsx; WH07.xlsx; 2019-12-12.Bradford Bypass Map.jpg; EH32.xlsx

Hey Devon,

I just received the attached fish data from the LSRCA.

Cheers,

Andrew

From: Kate Lillie <K.Lillie@lsrca.on.ca>
Sent: Thursday, December 12, 2019 2:57 PM
To: Minielly, Andrew <Andrew.Minielly@aecom.com>
Cc: Shawn Filson <S.Filson@lsrca.on.ca>
Subject: RE: LSRCA - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

Hi Andrew,

Please find attached fish data from LSRCA monitoring stations within the study area.

Kind regards,

Kate Lillie, HBSc, EP, ISA
Natural Heritage Ecologist
Lake Simcoe Region Conservation Authority
120 Bayview Parkway,
Newmarket, Ontario L3Y 3W3
905-895-1281, ext. 286 | 1-800-465-0437
k.lillie@LSRCA.on.ca | www.LSRCA.on.ca

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Sent: December 10, 2019 11:01 AM
To: Andrew.Minielly@aecom.com

Cc: Shawn Filson; Darren Campbell

Subject: RE: LSRCA - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

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Kind regards,

Kate Lillie, HBSc, EP, ISA
Natural Heritage Ecologist
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From: Minielly, Andrew [<mailto:Andrew.Minielly@aecom.com>]

Sent: December 4, 2019 11:37 AM

To: Shawn Filson

Cc: Piette, Jessica; Lohnes, Shelley; Ellis, Julie; Fowler, Devon; Easterling, Katie; Rankin, Sonia; Fleming, Braden;
larry.sarris@ontario.ca; Rhonda.Gibbon@ontario.ca

Subject: LSRCA - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

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Thank you and please do not hesitate to contact me if you have any questions or concerns,

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andrew.minielly@aecom.com

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Fowler, Devon

Subject: FW: MNRF Midhurst District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

From: Shirley, Brent (MNRF) <brent.shirley@ontario.ca>
Sent: December-11-19 10:47 AM
To: Fowler, Devon <Devon.Fowler@aecom.com>
Subject: RE: MNRF Midhurst District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

Hi Devon,

The first water crossing has rainbow trout and mottled scuplin listed in the fish community assemblage. Those species are indicative of cool / coldwater thermal regimes. Based on the fish community listed for the other crossings (2-8) I would assume that those waterbodies are more likely a warmwater thermal regime. When thermal regimes are determined by water temperature data rather than based on fish community assemblages they are much more accurate.

Hope this information is helpful.

Best Regards,
Brent

From: Fowler, Devon
Sent: December-11-19 10:21 AM
To: Shirley, Brent (MNRF) <brent.shirley@ontario.ca>
Subject: RE: MNRF Midhurst District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

Hi Brent,

I was hoping you could confirm the thermal regimes of WC-01 to WC-08 as LIO shows many of them as Unknown. Based on your recommended timing window I would assume warmwater possibly coolwater habitat, however want to make sure we are on the same page. No worries if they are truly unknown!

GWP or Project Name	Waterbody	Work Location (UTM Coordinates)	Flow	Thermal Regime	Fish Habitat*
Bradford Bypass Retainer - Assignment #: 2018-E- 0028 – Work Item 001	WC-01: Tributary to Pennville Creek	609218.449, 4885909.654	EA (1997) and NVCA (2013): Permanent	LIO (2019): Unknown NVCA (2013): Coolwater	LIO (2019) and EA (1997): Direct
Bradford Bypass Retainer - Assignment #: 2018-E- 0028 – Work Item 001	WC-02: Tributary to Holland River (Fraser Creek)	609930.3209, 4886069.943	EA (1997): Permanent	LIO (2019): Coolwater	LIO (2019) and EA (1997): Direct

GWP or Project Name	Waterbody	Work Location (UTM Coordinates)	Flow	Thermal Regime	Fish Habitat*
Bradford Bypass Retainer - Assignment #: 2018-E- 0028 – Work Item 001	WC-03: Tributary to Holland River (Tributary to Fraser Creek)	610547.9048, 4886272.661	EA (1997): Intermittent	LIO (2019): Unknown	LIO (2019): Direct
Bradford Bypass Retainer - Assignment #: 2018-E- 0028 – Work Item 001	WC-04: Holland River Tributary (White Cedar Swamp)	612791.95, 4886960.961	EA (1997): Intermittent	LIO (2019): Unknown	LIO (2019): Direct
Bradford Bypass Retainer - Assignment #: 2018-E- 0028 – Work Item 001	WC-05: Holland River Tributary (White Cedar Swamp)	613197.386, 4887078.821	EA (1997): Intermittent	LIO (2019): Unknown	LIO (2019): Direct
Bradford Bypass Retainer - Assignment #: 2018-E- 0028 – Work Item 001	WC-06: Holland River Tributary (Cultivated Waterways)	615116.8616, 4887564.306	EA (1997): Intermittent	LIO (2019): Unknown	LIO (2019): Direct
Bradford Bypass Retainer - Assignment #: 2018-E- 0028 – Work Item 001	WC-07: Holland River Tributary (Cultivated Waterway)	615762.6669, 4887454.459	EA (1997): Intermittent	LIO (2019): Warmwater	LIO (2019): Direct
Bradford Bypass Retainer - Assignment #: 2018-E- 0028 – Work Item 001	WC-08: West Holland River (Holland River West Branch)	616323.0212, 4887569.116	EA (1997) and LSRCA (2010): Permanent	LIO (2019) and LSRCA (2010): Warmwater	LIO (2019) and LSRCA (2010): Direct

Thanks!

Devon Fowler, Hon. B.Sc.

Aquatic Ecologist, Water & Natural Resources, Environment

Office: 705-797-3293

Cell: 226-820-6156



55 Cedar Pointe Drive, Suite 620

Barrie Ontario L4N 5R7

T: 705-721-9222

F: 705-734-0764

www.aecom.com

Minielly, Andrew

From: Shirley, Brent (MNRF) <brent.shirley@ontario.ca>
Sent: Wednesday, December 11, 2019 9:41 AM
To: Minielly, Andrew
Cc: Piette, Jessica; Lohnes, Shelley; Ellis, Julie; Fowler, Devon; Easterling, Katie; Rankin, Sonia; Fleming, Braden; Sarris, Larry (MTO); Gribbon, Rhonda (MTO)
Subject: RE: MNRF Midhurst District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

Hi Andrew,

As stated in my earlier email my comments with pertain to the Simcoe County portion of the study area for your project.

The in-water timing window for water crossings 1-8 is no in-water work between March 15-July 15.

All **known** natural heritage features are mapped in LIO and are available. Just because natural heritage features and / or significant wildlife habitat is not identified that doesn't mean that it doesn't exist. Evaluating for other natural heritage values for example candidate significant wildlife habitats (SWH) will be informed by direction in the Natural Heritage Reference Manual, the Significant Wildlife Habitat Technical Guide and SWH Criteria Schedule for Ecoregion 6E. Your field work will inform your review of the study area for natural heritage features and functions.

If you have any questions or concerns please feel free to call or email me at any time.

Best Regards,

Brent Shirley

A/ Management Biologist | Midhurst District Ministry of Natural Resources & Forestry | 2284 Nursery Rd | Midhurst, ON | L9X 1N8 | Phone 705-725-7547 | Fax- 705-725-7584

Please Note: As of July 2, 2019, I will no longer have voicemail services with my office phonenumber. My phone line has been re-directed to Shannon Lawless for messaging; however should I miss your call you can email me directly or send your questions or request to midhurstinfo@ontario.ca where your inquiry will be forwarded back to me or re-directed towards another staff member.

From: Minielly, Andrew <Andrew.Minielly@aecom.com>
Sent: December-06-19 9:21 AM
To: MIDHURSTINFO (MNRF) <MIDHURSTINFO@ontario.ca>
Cc: Piette, Jessica <Jessica.Piette@aecom.com>; Lohnes, Shelley <Shelley.Lohnes@aecom.com>; Ellis, Julie <Julie.Ellis@aecom.com>; Fowler, Devon <Devon.Fowler@aecom.com>; Easterling, Katie <katie.easterling@aecom.com>; Rankin, Sonia <sonia.rankin@aecom.com>; Fleming, Braden <Braden.Fleming@aecom.com>; Sarris, Larry (MTO) <Larry.Sarris@ontario.ca>; Gribbon, Rhonda (MTO) <Rhonda.Gribbon@ontario.ca>

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Good morning,

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AECOM would kindly like to request that the MNRF review the list of Natural Heritage, SOCC and aquatic resource records identified for the Study Area (Provided in Attachment 1) and confirm if there are any other records that should be considered for this project. Any data received by December 18th can be included in the first draft of our report, however data received after this date will be included in final drafts of the reports to be issued by February 1, 2020.

Thank you and please do not hesitate to contact me if you have any questions or concerns,

Andrew Minielly, (Hons) B.ES
Terrestrial Ecologist, Water & Natural Resources, Environment
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Minielly, Andrew

From: Brothers, Brianne (MNRF) <Brianne.Brothers@ontario.ca>
Sent: Monday, December 16, 2019 4:16 PM
To: Minielly, Andrew
Subject: RE: MNRF Aurora District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request
Attachments: MTO_BradfordBackgroundReview.pdf

Hello Andrew,

Please find the attached comments regarding the Bradford Bypass project.

Thank you,

Brianne

Brianne Brothers
IRM Technical Specialist | Aurora District
Ministry of Natural Resources and Forestry
50 Bloomington Road, 4th Floor, Aurora, ON | L4G 0L8
☎ 905-713-7390 | ✉ brianne.brothers@ontario.ca



From: Scientific Collection Permits Aurora (MNRF) <scp.aurora@ontario.ca>
Sent: December 10, 2019 2:29 PM
To: Bobak, Eva (MNRF) <Eva.Bobak@ontario.ca>; Brothers, Brianne (MNRF) <Brianne.Brothers@ontario.ca>
Subject: FW: MNRF Aurora District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

Hi Eva and Brianne,

As per Joad's direction, I am forwarding you both a natural heritage information request regarding an MTO project. The consultants are looking for fish collection records and other natural heritage information. Varga has also been forwarded this email to provide natural heritage features, such as wetlands, etc. I do not know how you two want to divide this up, but the consultants have multiple sites and are requesting information for each one. You may want to work with Varga to provide one email response with MNRF's comments.

Thank you,

Tessa

From: ESA Aurora (MNRF) <ESA.Aurora@ontario.ca>
Sent: December 4, 2019 12:19 PM
To: Scientific Collection Permits Aurora (MNRF) <scp.aurora@ontario.ca>

Subject: FW: MNRF Aurora District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

From: Minielly, Andrew <Andrew.Minielly@aecom.com>

Sent: December 4, 2019 11:38 AM

To: ESA Aurora (MNRF) <ESA.Aurora@ontario.ca>

Cc: Piette, Jessica <Jessica.Piette@aecom.com>; Lohnes, Shelley <Shelley.Lohnes@aecom.com>; Ellis, Julie <Julie.Ellis@aecom.com>; Fowler, Devon <Devon.Fowler@aecom.com>; Easterling, Katie <katie.easterling@aecom.com>; Rankin, Sonia <sonia.rankin@aecom.com>; Fleming, Braden <Braden.Fleming@aecom.com>; Sarris, Larry (MTO) <Larry.Sarris@ontario.ca>; Gribbon, Rhonda (MTO) <Rhonda.Gribbon@ontario.ca>

Subject: MNRF Aurora District - Ministry of Transportation - Bradford Bypass (Highway 400 - 404 Link)- Background Information Request

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

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Attachment 1

The tables below summarize all available Natural Heritage, Species of Conservation Concern (SOCC) and aquatic resource records identified within the Background Data Request Study Area. All natural heritage features identified in the Study Area are presented in **Table 1**.

Table 1. Natural Heritage Features Identified Within the Study Area

Feature Name	Feature Significance
Holland Marsh (BW5)	Provincially Significant Wetland
Holland Marsh Wetland Complex	Provincially Significant Wetland
Maskinonge River Wetland Complex	Provincially Significant Wetland
Holland River Marsh	Provincially Significant ANSI
Holland Marsh Environmentally Significant Area (ESA)	Lake Simcoe Region Conservation Authority (LSRCA) ESA

Several unevaluated wetlands exist within the study area and should be considered for impacts as well (may become significant upon evaluation)

A total of 18 SOCC have been identified within the vicinity of the proposed work area. These species are listed in **Table 2** below.

Table 2. Species of SOCC Identified through NHIC.

Common Name	Scientific Name	S-Rank ¹	ESA Status ²	COSEWIC Status ³	Source of Record	Year of Observation
Black Tern	<i>Chlidonias niger</i>	S3B	SC	NAR	NHIC, OBBA	2001-2005
Canada Warbler	<i>Cardellina canadensis</i>	S4B	SC	THR	EA, OBBA	2001-2005
Common Nighthawk	<i>Chordeiles minor</i>	S4B	SC	SC	EA, OBBA	2001-2005
Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	SC	SC	EA, OBBA	2001-2005
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	S4B	SC	THR	EA, OBBA	2001-2005
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	S4B	SC	SC	OBBA	2001-2005
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	S4B	SC	END	NHIC, OBBA	2003
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	SC	THR	EA, NHIC, OBBA	2001-2005
Yellow Rail	<i>Coturnicops noveboracensis</i>	S4B	SC	SC	NHIC	1985
Western Chorus Frog (Great Lakes/St. Lawrence – Canadian Shield population)	<i>Pseudacris maculata</i>	S3	NAR	THR	ORAA	2017

Common Name	Scientific Name	S-Rank ¹	ESA Status ²	COSEWIC Status ³	Source of Record	Year of Observation
Northern Map Turtle	<i>Graptemys geographica</i>	S3	SC	SC	ORAA	1993
Snapping Turtle	<i>Chelydra serpentina</i>	S3	SC	SC	ORAA	2019
Green-striped Darner	<i>Aeshna verticalis</i>	S3	No Status	No Status	NHIC	1941
Monarch	<i>Danaus plexippus</i>	S2N, S4B	SC	END	OBA	2018
Black Ash	<i>Fraxinus nigra</i>	S3	No Status	THR	EA	1995
Early-branching Panicgrass	<i>Dichanthelium praecocius</i>	S3	No Status	No Status	NHIC	1977
Houghton's Flatsedge	<i>Cyperus houghtonii</i>	S3	No Status	No Status	NHIC	1976
Bristly Buttercup	<i>Ranunculus hispidus</i>	S3	No Status	No Status	EA	1995

With respect to aquatic Species at Risk, both DFO SAR Mapping and MNR's NHIC were reviewed and no aquatic SAR were identified within the Study Area.

The 1997 Environmental Assessment (EA) report, MNR's LIO database and Fish ON-Line web resource were reviewed to glean a better understanding of the aquatic features within the Study Area (**Figure 1**). **Table 3** below includes the available data regarding fish communities and habitat that may occur within the watercourses that have been identified within the Study Area.

Table 3. Watercourses Identified Within the Study Area

Crossing Number	Structure/ work location/ (UTM Coordinates)	Watercourse Name	Watercourse classification	Habitat information/ locations	Historical data on fish species present, including whether the subject waterbody(s) are considered to support any vulnerable aquatic species	MNRF fisheries management objectives, if applicable	In-water timing windows for construction
Crossing Number	Structure/ work location/ (UTM Coordinates)	Watercourse Name	Watercourse classification	Habitat information/ locations	Historical data on fish species present, including whether the subject waterbody(s) are considered to support any vulnerable aquatic species	MNRF fisheries management objectives, if applicable	In-water timing windows for construction
1	609218.449, 4885909.654	Tributary to Pennville Creek	Unknown	Intermittent flow, no known barriers in the vicinity, contains habitat for warmwater species (1997, EA).	Blacknose Dace, Blacknose Shiner, Bluntnose Minnow, Brassy Minnow, Brook Stickleback, Brown Bullhead, Common Shiner, Creek Chub, Fathead Minnow, Finescale Dace, Johnny Darter, Largemouth Bass, Longnose Dace, Mottled Sculpin, Northern Redbelly Dace, Pumpkinseed, Rainbow Darter, Rainbow Trout, Rock Bass, White Crappie and White Sucker.	Lake Simcoe Fisheries Community Objectives	Unknown
2	609930.3209, 4886069.943	Tributary to Holland River	Coolwater	Unknown	Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Fathead Minnow, Golden Shiner, Goldfish, Hornyhead Chub, Johnny Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Smallmouth Bass, White Sucker and Yellow Perch.	Lake Simcoe Fisheries Community Objectives	June 1 to March 15 March 15- July 15 (no works)
3	610547.9048, 4886272.661	Tributary to Holland River	Unknown	Unknown	Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp.,	Lake Simcoe Fisheries Community Objectives	Unknown

Crossing Number	Structure/ work location/ (UTM Coordinates)	Watercourse Name	Watercourse classification	Habitat information/ locations	Historical data on fish species present, including whether the subject waterbody(s) are considered to support any vulnerable aquatic species	MNRF fisheries management objectives, if applicable	In-water timing windows for construction
					Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.		
4	612791.95, 4886960.961	Tributary to Holland River	Unknown	Unknown	Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.	Lake Simcoe Fisheries Community Objectives	Unknown
5	613197.386, 4887078.821	Tributary to Holland River	Unknown	Unknown	Blacknose Dace, Bluntnose Minnow, Brook Stickleback, Central Mudminnow, Common Shiner, Creek Chub, Fathead Minnow, Johnny Darter, Largemouth Bass, Lepomis sp., Longnose Dace, Northern Pike, Northern Redbelly Dace, Pumpkinseed and White Sucker.	Lake Simcoe Fisheries Community Objectives	Unknown
6	615116.8616, 4887564.306	Tributary to Holland River	Unknown	Unknown	Blacknose Dace, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Carps and Minnows, Central Mudminnow, Common Shiner, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Johnny Darter, Largemouth Bass, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Rock Bass, White Sucker and Yellow Perch.	Lake Simcoe Fisheries Community Objectives	Unknown
7	615762.6669, 4887454.459	Tributary to Holland River	Warmwater	Unknown	See Fish Community Above Significant muskie/pike spawning	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 1-July 15 (no works)

Crossing Number	Structure/ work location/ (UTM Coordinates)	Watercourse Name	Watercourse classification	Habitat information/ locations	Historical data on fish species present, including whether the subject waterbody(s) are considered to support any vulnerable aquatic species	MNRF fisheries management objectives, if applicable	In-water timing windows for construction
8	616323.0212, 4887569.116	Holland River	Warmwater	Permanent flow, no known barriers; supports a diverse assemblage of many warmwater species, contains spawning habitat for muskellunge and warmwater species, likely contains nursery habitat for Northern Pike.	Rock Bass, Brook Stickleback, Northern Pike, Johnny Darter/ Tessellated Darter, Pumpkinseed, Largemouth Bass, Emerald Shiner, Yellow Perch, Black Crappie, Walleye, Common Carp, Golden Shiner, Bluntnose Minnow and Spottail Shiner.	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 1-July 15 (for pike and muskie, as identified)
9	616421.4807, 4887579.872	Tributary to Holland River	Warmwater	Unknown	Black Crappie, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Common Carp, Creek Chub, Emerald Shiner, Fathead Minnow, Golden Shiner, Goldfish, Johnny Darter, Johnny Darter/ Tessellated Darter, Largemouth Bass, Lepomis sp., Northern Pike, Pumpkinseed, Rock Bass, Spottail Shiner, Walleye, White Sucker, Yellow Perch	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 1-July 15 (for pike and muskie, as identified)
10	616752.5582, 4887653.739	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries	June 1 to March 31 March 15-July 15 (no works)

Crossing Number	Structure/ work location/ (UTM Coordinates)	Watercourse Name	Watercourse classification	Habitat information/ locations	Historical data on fish species present, including whether the subject waterbody(s) are considered to support any vulnerable aquatic species	MNRF fisheries management objectives, if applicable	In-water timing windows for construction
						Community Objectives	
11	616797.5375, 4887641.833	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
12	616827.9646, 4887700.041	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
13	616879.5585, 4887657.708	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
14	616949.6732, 4887722.531	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
15	617035.663, 4887719.885	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
16	617100.486, 4887710.625	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (for pike and muskie, as identified)
17	617195.7362, 4887766.187	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries	June 1 to March 31 March 15-July 15 (no works)

Crossing Number	Structure/ work location/ (UTM Coordinates)	Watercourse Name	Watercourse classification	Habitat information/ locations	Historical data on fish species present, including whether the subject waterbody(s) are considered to support any vulnerable aquatic species	MNRF fisheries management objectives, if applicable	In-water timing windows for construction
						Community Objectives	
18	617263.3369, 4887804.193	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
19	617304.1845, 4887800.38	Unnamed Drain	Warmwater	Unknown	See Fish Community Above	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
20	617654.7892, 4887836.302	Unnamed Drain	Unknown	Unknown	Unknown	Lake Simcoe Fisheries Community Objectives	Unknown March 15-July 15 (no works)
21	618939.5026, 4888106.556	Holland River East Branch	Warmwater	Permanent flow, no known barriers; supports a diverse assemblage of many warmwater species, contains spawning habitat for muskellunge and warmwater species, likely	Brown Bullhead, Bowfin, Common Carp, Northern Pike, Pumpkinseed, Largemouth Bass, Golden Shiner, Spottail Shiner, Black Crappie, Rock Bass, Yellow Perch and Fathead Minnow	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 1-July 15 (for pike and muskie, as identified)

Crossing Number	Structure/ work location/ (UTM Coordinates)	Watercourse Name	Watercourse classification	Habitat information/ locations	Historical data on fish species present, including whether the subject waterbody(s) are considered to support any vulnerable aquatic species	MNRF fisheries management objectives, if applicable	In-water timing windows for construction
				contains nursery habitat for Northern Pike (1997, EA).			
22	620961.9719, 4888719.425	Tributary to Holland River East Branch	Warmwater	Unknown	Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
23	621711.5585, 4889266.293	Unnamed Drain	Warmwater	Unknown	Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
24	622946.7263, 4889756.589	Unnamed Tributary	Warmwater	Unknown	Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
25	623418.1643, 4889926.307	Unnamed Tributary	Warmwater	Unknown	Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
26	623672.7409, 4889997.022	Unnamed Tributary	Warmwater	Unknown	Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)

Crossing Number	Structure/ work location/ (UTM Coordinates)	Watercourse Name	Watercourse classification	Habitat information/ locations	Historical data on fish species present, including whether the subject waterbody(s) are considered to support any vulnerable aquatic species	MNRF fisheries management objectives, if applicable	In-water timing windows for construction
27	623941.4606, 4890096.024	Unnamed Tributary	Warmwater	Unknown	Brown Bullhead, Carps and Minnows, Central Mudminnow, Creek Chub, Fathead Minnow, Golden Shiner, Largemouth Bass, Northern Pike, Pumpkinseed, Smallmouth Bass and White Sucker.	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)
28	624846.6217, 4890350.601	Maskinonge (Jersey) River	Warmwater	Permanent flow, no known barriers, lower reaches, near Lake Simcoe, may support muskellunge and warmwater species such as Largemouth Bass and Northern Pike. Upper reaches may support a warmwater community (1997, EA).	Black Crappie, Blacknose Dace, Bluegill, Bluntnose Minnow, Bowfin, Brook Stickleback, Brown Bullhead, Central Mudminnow, Common Carp, Common Shiner, Creek Chub, Emerald Shiner, Etheostoma sp., Fathead Minnow, Golden Shiner, Hornyhead Chub, Johnny Darter, Johnny Darter/ Tesselated Darter, Largemouth Bass, Mimic Shiner, Mottled Sculpin, Northern Pike, Northern Redbelly Dace, Pumpkinseed, Redfin Shiner, White Sucker and Yellow Perch.	Lake Simcoe Fisheries Community Objectives	June 1 to March 31 March 15-July 15 (no works)

