

Natural Sciences Report

Etobicoke Creek Trunk Sewer Improvements and Upgrades Class Environmental Assessment

for:

Jacobs

by:

**LGL Limited
environmental research associates**

**October 2020
LGL File TA8907**



Etobicoke Creek Trunk Sewer Improvements and Upgrades Class Environmental Assessment Natural Sciences Report

prepared by:



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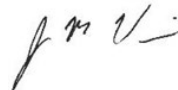
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Analysis and new Study area
5, Includes additional vegetation
inventory

**October 2020
LGL Project TA8907**

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1.0 Introduction

LGL Limited (LGL) has been retained by Jacobs to provide natural sciences support for the Schedule C Municipal Class Environmental Assessment (EA) for improvements and upgrades to the Etobicoke Creek Trunk Sewer in Brampton, Ontario. As the project may involve a realignment of the existing sewer, a Natural Heritage Investigation will be required to evaluate alternatives make recommendations for mitigation of impacts at the preferred location.

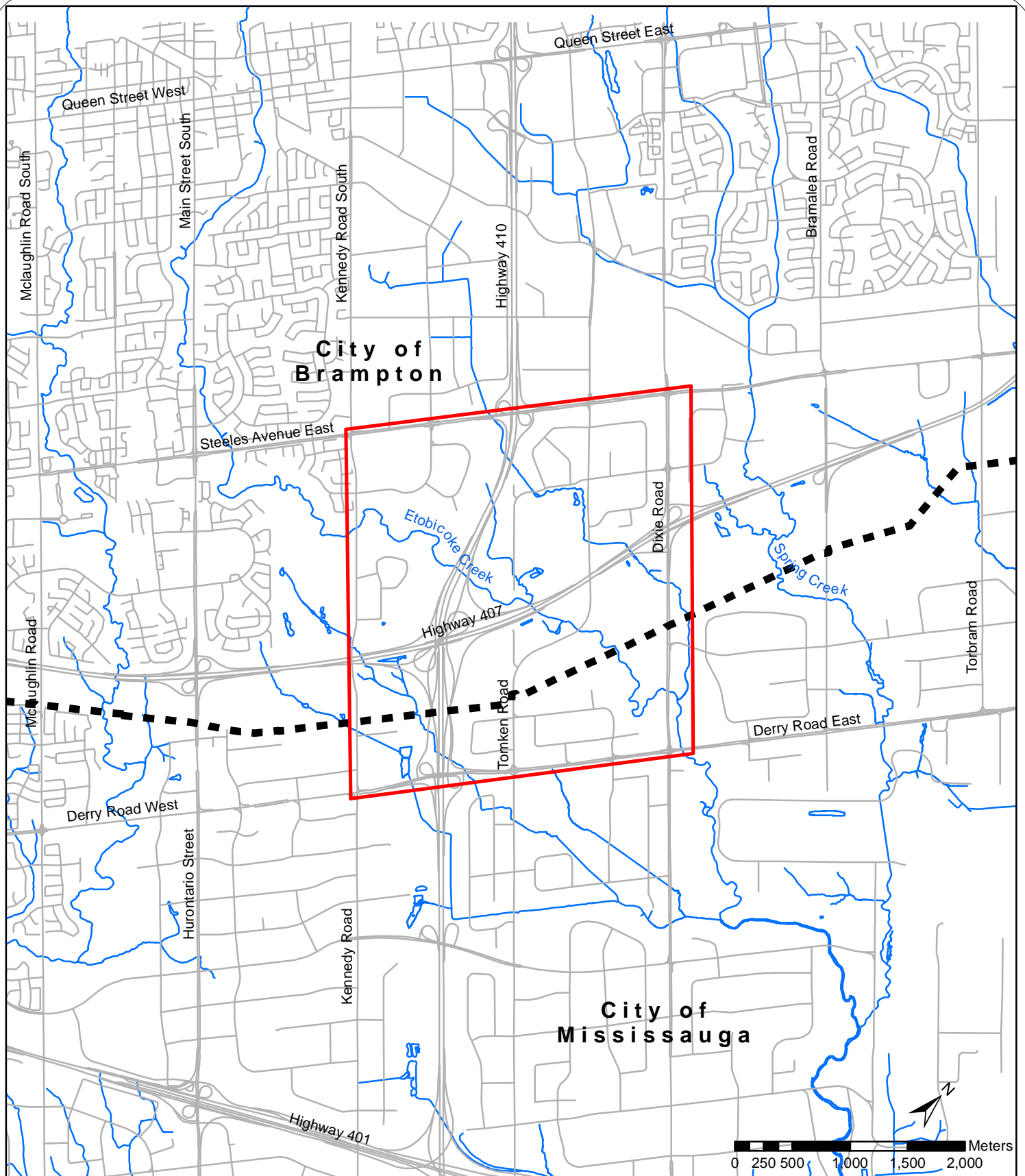
The study area in Brampton, Ontario, is in the vicinity of the intersection of Highway 410 and the 407 ETR. The study area is generally bounded by Kennedy Road to the west, Dixie Road to the east, Steeles Avenue to the north, and Derry Road to the south (Figure 1). The main natural heritage feature in the study area is the Etobicoke Creek, which flows in a southeasterly direction through the study area.

LGL's Natural Sciences Report (NSR) provides a summary of the environmental sensitivities present within the study area as determined through a records review, as well it provides preliminary guidance for selection of alternatives and mitigation recommendations to protect these features for use by the Project Team.

Once further details of the preferred alternative are available to LGL the alignment will be assessed to identify potential impacts and appropriate mitigation and management measures to protect natural heritage features such as fish habitat, wetlands, Species at Risk (SAR) and vegetation. This assessment will be included in the Technical Memorandum that will follow. The NSR provides info on the natural features in the study area based on a background review and preliminary site visit.

1.1 Project Summary

The Region of Peel (Region) intends to address future capacity needs and alleviate issues with the current alignment of the Etobicoke Creek Trunk Sewer. Issues include sewer surcharging, hydraulic restrictions, and aged infrastructure in the vicinity of the abandoned Wastewater Treatment Plant.



Etobicoke Creek Trunk Sewer Improvements and Upgrades Key Map

- Study Area
- Road
- Watercourse



Project	TA8907	Figure	1
Date	August 2020	Prepared By	KC
Scale	1:45,000	Verified By	AHF

2.0 Background Information Records Review

To characterize the study area, LGL has gathered information from available background sources. Information where available was requested or collected from:

- Region of Peel;
- City of Brampton;
- City of Mississauga;
- Toronto Region Conservation Authority (TRCA) (TRCA database review and consultation with S. Lingertat, Planner, June 14, 2019);
- Land Information Ontario (LIO) database;
- Ministry of the Environment, Conservation, and Parks (MECP);
- Natural Heritage Information Centre (NHIC);
- Ministry of Natural Resources and Forestry (MNRF);
- Ontario Breeding Bird Atlas (OBBA);
- eBird;
- iNaturalist and,
- Ontario Nature.

This background review was used to identify potential natural environment constraints present within the study area as summarized in the following sections. From there, field surveys were completed to verify the limits and extent of features identified through background review in relation to the subject property.

3.0 Natural Heritage Existing Conditions

3.1 Physiography, Soils, Hydrogeology

The study area is found within the Peel Plain physiographic region and surficial geology (TRCA 2010). This plain is a level to undulating beds of clay soils that extends from the Niagara Escarpment, through the central portion of the Regional Municipalities of Halton, Peel and York (Chapman and Putnam, 1984). Groundwater recharge in the area is relatively low due to the predominantly clay and silt substrate (TRCA 2010) and the removal of forests for agriculture and land development (Chapman and Putnam, 1984).

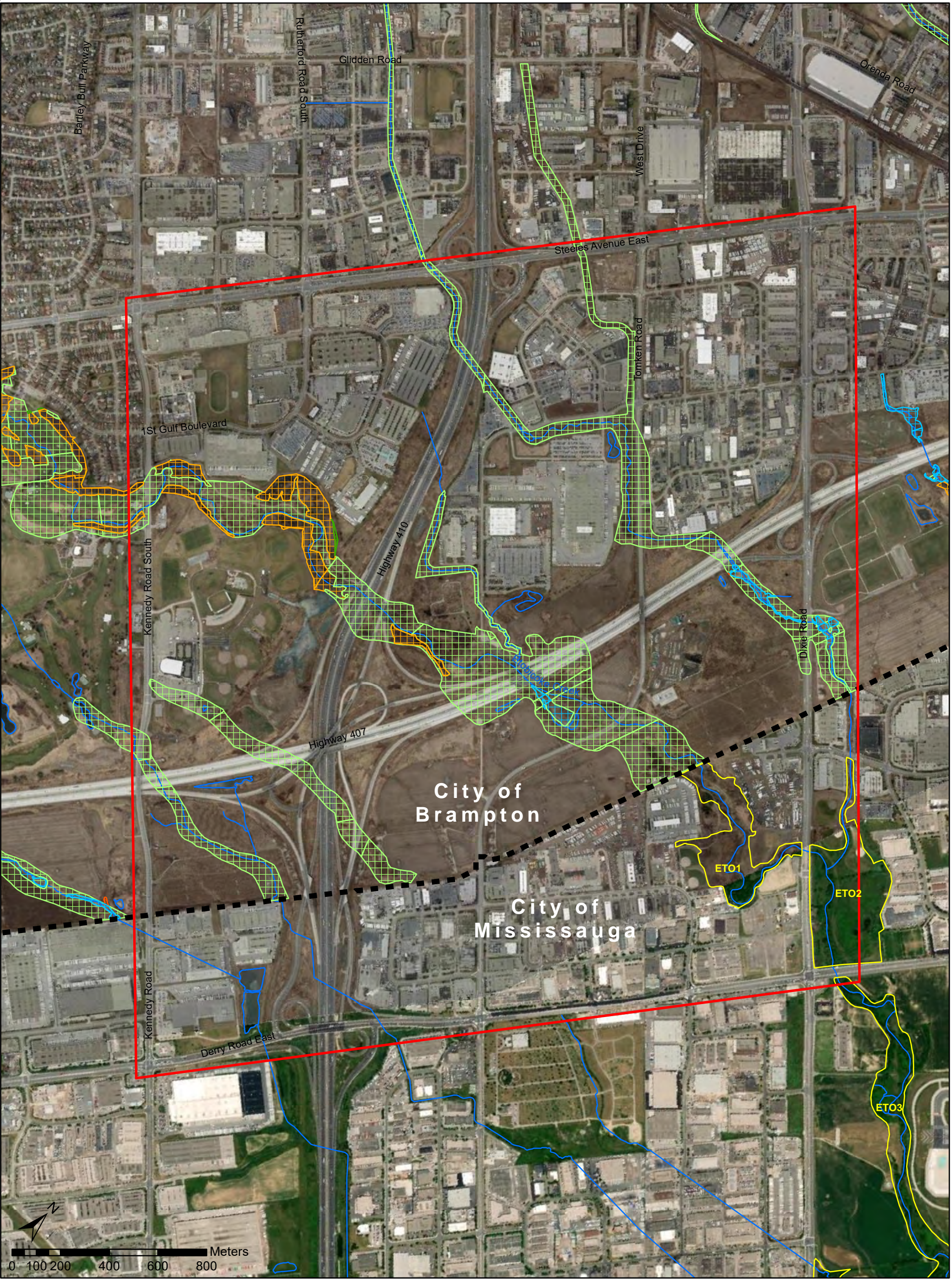
Soils within the study area are dominated by Peel Clay with a small portion near Kennedy Road being composed of Fox Sandy Loam (Hoffman and Richards, 1953). Peel clay is formed from stone-free lacustrine material and contains fairly high organic matter. Fox sandy loam soils have developed on well sorted sandy outwash materials of medium lime content and occur on smooth gently sloping topography. Etobicoke Creek consist of lacustrine soils that are variable and poorly defined. Cashel clay occurs in the south western limits of the study area near Mount Charles Park and is characterized by lacustrine soils over heavy till.

The TRCA has set up a Regional Watershed Monitoring Program to monitor the geomorphic processes in the watershed. Etobicoke Creek Site A is within our study area. Migration of 0.13 m per year was observed, with a maximum of 0.41m/yr. (TRCA 2010).

The Mississauga Natural Areas Survey Natural Areas Fact Sheets for ET01 and ET02 (City of Mississauga 2015) indicates the bedrock geology of the area consists of grey shales of the Georgian Bay Formation overlain with soils and glacial deposits of Cashel clay.

3.2 Designated Natural Areas

Etobicoke Creek and its associated valleylands are mapped as “Valleyland/Watercourse Corridor” on Schedule D of the City of Brampton’s Official Plan (City of Brampton (2006) (See Figure 2). Schedule D also identifies woodlands and wetlands within the study area. Schedule A maps the Etobicoke Creek valley as Open Space.



Etobicoke Creek Trunk Sewer Improvements and Upgrades
Background Data Review (Brampton & Mississauga)

- Study Area
- Municipal Boundary
- Watercourse
- Waterbody
- Significant Natural Area (Natural Areas Survey, City of Mississauga)

- Natural Heritage System (City of Brampton)
- Valleyland
 - Valleyland / Wetland
 - Valleyland / Wetland / Woodland
 - Valleyland / Woodland

- Wetland
- Woodland

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Date	August 2020	Prepared By	KC
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The southern portion of the study area is within the City of Mississauga. In Mississauga, Etobicoke Creek and its associated valleylands are designated as Significant Natural Area and Natural Green Spaces on Schedule 3 as well as Greenlands and Natural Hazard on Schedule 10. The Mississauga Natural Areas Survey (City of Mississauga 2014) identifies natural area ET01 in the study area, and ET02 just west of the study area.

Schedule A of the Regional Official Plan (2016) identifies the valleylands as part of the core area of the Greenlands System. Figure 2 of the Regional Official Plan indicates Etobicoke Creek is a river valley connection outside of the greenbelt.

No areas of Provincial significance (such as an Area of Natural or Scientific Interest, Provincially Significant Wetland or Significant Wildlife Habitat) were identified within the study area.

3.3 Vegetation and Vegetation Communities

Vegetation communities are described through a combination of background data and through observations made on site by LGL in May 2020, and October 2020.

3.3.1 Background Information

According to the TRCA's Etobicoke Creek and Mimico Creek Watersheds Technical Update Report (TRCA 2010) only 12.4% of the Etobicoke Creek watershed has natural cover. Etobicoke Creek in the project area is well vegetated, and likely comprises a good portion of the natural cover in the watershed resulting from considerable restoration efforts. In 2008, the Kennedy Valley Restoration Project was initiated to add a trail in the vicinity the Kennedy Road Crossing and Highway 410 Crossing as well as restore some of the natural areas along the route. Wetlands and wildlife habitat features were created to enhance the natural heritage system and corridor.

The composition, structure and function of vegetation communities within the study area were identified through a combination of background Ecological Land Classification (ELC) by TRCA, air photo interpretation and field investigation. Natural vegetation communities identified within the study area were classified according to the Ecological Land Classification for Southern Ontario: First Approximation and Its Application (Lee et al. 1998) and TRCA Community nomenclature. The results of this survey are included in section 3.3.2. The following sections summarize the background ELC and vegetation information available through searches of TRCA data, City of Mississauga Natural

Areas Survey information, and NHIC database.

3.3.1.1 TRCA Vegetation Communities

ELC for the study area was available from TRCA (See Figure 3 and Table 1). Of the various communities present, many are cultural. A few pockets of forest communities exist along the valley slopes of Etobicoke Creek as well as some marsh wetland pockets within the floodplain. The ELC communities for the study area were updated by LGL in 2019 and 2020 (see section 3.3.2).

Table 1: Summary of TRCA Ecological Land Classification Vegetation Communities.

Terrestrial Community	ELC Code	ELC Vegetation Community
Cultural Meadow	CUM1-b	Exotic Cool-season Grass Graminoid Meadow
Cultural Meadow	CUM1-c	Exotic Forb Meadow
Cultural Plantation	CUP3-3	Scotch Pine Coniferous Plantation
Cultural Thicket	CUT1-c	Exotic Deciduous Thicket
Cultural Thicket	CUT1-A1	White Cedar Successional Woodland
Cultural Woodland	CUW1-A3	Native Deciduous Successional Woodland
Cultural Woodland	CUW1-B	Exotic Successional Woodland
Cultural Woodland	CUW1-D	Hawthorn Successional Woodland
Deciduous Forest	FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest
Deciduous Forest	FOD5-4	Dry-Fresh Sugar Maple – Ironwood Deciduous Forest
Deciduous Forest	FOD6-5	Fresh-Moist Sugar Maple – White Elm Deciduous Forest
Deciduous Forest	FOD7-a	Fresh-Moist Manitoba Maple Lowland Deciduous Forest
Deciduous Forest	FOD7-2	Fresh-Moist Ash Deciduous Forest
Deciduous Forest	FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest
Deciduous Forest	FOD7-4	Fresh-Moist Black Walnut Lowland Deciduous Forest
Mineral Meadow Marsh	MAM2-a	Common Reed Mineral Meadow Marsh
Mineral Meadow Marsh	MAM2-2	Reed Canary Grass Mineral Meadow Marsh
Mineral Shallow Marsh	MAS2-1b	Cattail Mineral Shallow Marsh
Open Aquatic	OA01	Open Water Aquatic
Open Aquatic	OA01-T	Turbid Open Aquatic



LEGEND

- Study Area
- ELC Communities (TRCA)
- Watercourse (LIO)
- Waterbody (LIO)

- ELC Communities**
- CUM1-A Native Forb Meadow
 - CUM1-b Exotic Cool-season Grass Graminoid Meadow
 - CUM1-c Exotic Forb Meadow
 - CUP3-3 Scots Pine Coniferous Plantation
 - CUS1-b Exotic Successional Savannah
 - CUT1-A1 Native Deciduous Sapling Regeneration Thicket
 - CUT1-c Exotic Deciduous Thicket
 - CUW1-A3 Native Deciduous Successional Woodland
 - CUW1-b Exotic Successional Woodland
 - CUW1-D Hawthorn Successional Woodland
 - FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest
 - FOD5-4 Dry-Fresh Sugar Maple - Ironwood Deciduous Forest
 - FOD6-5 Fresh-Moist Sugar Maple - Hardwood Deciduous Forest
 - FOD7-1 Fresh-Moist White Elm Lowland Deciduous Forest
 - FOD7-2 Fresh-Moist Ash Deciduous Forest
 - FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest
 - FOD7-4 Fresh-Moist Black Walnut Lowland Deciduous Forest
 - FOD7-a Fresh-Moist Manitoba Maple Lowland Deciduous Forest
 - MAM2-2 Reed Canary Grass Mineral Meadow Marsh
 - MAM2-a Common Reed Mineral Meadow Marsh
 - MAM2-b Purple Loosestrife Mineral Meadow Marsh
 - MAM2-1A Broad-leaved Cattail Mineral Shallow Marsh
 - MAM2-1b Narrow-leaved Cattail Mineral Shallow Marsh
 - MAM2-d Reed Canary Grass Mineral Shallow Marsh
 - OA01 Duckweed Floating-leaved Shallow Aquatic
 - OA01-T Open Aquatic (unvegetated)
 - SAF1-3 Turbin Open Aquatic (unvegetated)
 - AGR Agricultural

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**Etobicoke Creek Trunk
Sewer Improvements
and Upgrades**
Background Data Review (TRCA)



Project	TA8907	Figure	3
Date	August 2020	Prepared By:	KC
Scale	1:14,000	Verified By:	AHF

The City of Mississauga Natural Areas Survey Natural Areas Fact Sheet for ET01 (2015) was reviewed for the background screening. The ELC for this study differs from that of the TRCA and is considered to be more current and a higher level of detail than the TRCA ELC data. Information available is only for the southern portion of the study area south of the Highway 407 within the municipal boundary of Mississauga. The Natural Areas Survey indicates the community types are Dry-fresh Sugar Maple-Beech Deciduous Forest (FOD5-2), Dry-fresh Deciduous Forest Ecosite (FOD4), Fresh-moist Willow Lowland Deciduous Forest Type (FOD7-3), Dry-moist Black Walnut Lowland Deciduous Forest Type (FOD7-4), and Dry-moist Old Field Meadow Type (CUM1-1) (Figure 3).

The fact sheet for ET02 (2015) was also referenced. The ELC for the natural area northeast of the intersection of Derry Road and Dixie Road consists of four communities, Dry-moist Old Field Meadow Type (CUM1-1), Reed Canary Grass Mineral Meadow Marsh (MAM2-2), Cattail Mineral Shallow Marsh (MAM2-1), and Open Water Aquatic (OAO).

3.3.1.2 Flora

A total of 19 species were found in the background search of TRCA flora data. These plant species are listed in Table 2. All species listed are native, and relatively common.

Table 2: List of Flora available for Study Area from TRCA Database.

Common Name	Scientific Name	Local Status
American beech	<i>Fagus grandifolia</i>	L4
barber-pole bulrush	<i>Scirpus microcarpus</i>	L5
bitternut hickory	<i>Carya cordiformis</i>	L4
bur oak	<i>Quercus macrocarpa</i>	L4
common arrowhead	<i>Sagittaria latifolia</i>	L4
eastern hemlock	<i>Tsuga canadensis</i>	L4
great bur-reed	<i>Sparganium eurycarpum</i>	L3
large-toothed aspen	<i>Populus grandidentata</i>	L4
May-apple	<i>Podophyllum peltatum</i>	L5
Michigan lily	<i>Lilium michiganense</i>	L4
ninebark	<i>Physocarpus opulifolius</i>	L3
red maple	<i>Acer rubrum</i>	L4
red oak	<i>Quercus rubra</i>	L4
running strawberry-bush	<i>Euonymus obovatus</i>	L3
silver maple	<i>Acer saccharinum</i>	L4
soft-stemmed bulrush	<i>Schoenoplectus tabernaemontani</i>	L4

Common Name	Scientific Name	Local Status
tall wood reed	<i>Cinna arundinacea</i>	L3
Torrey's rush	<i>Juncus torreyi</i>	L4
white baneberry	<i>Actaea pachypoda</i>	L4

Table 2 Legend

Rank Level of Conservation Concern in TRCA Region

L5 Able to withstand high levels of disturbance; generally secure throughout the jurisdiction, including the urban matrix. May be of very localized concern in highly degraded areas.

L4 Able to withstand some disturbance; generally secure in rural matrix; of concern in urban matrix.

L3 Able to withstand minor disturbance; generally secure in natural matrix; considered to be of regional concern.

L2 Unable to withstand disturbance; some criteria are very limiting factors; generally occur in high-quality natural areas, in natural matrix; probably rare in the TRCA jurisdiction; of concern regionally.

L1 Unable to withstand disturbance; many criteria are limiting factors; generally occur in high-quality natural areas in natural matrix; almost certainly rare in the TRCA jurisdiction; of concern regionally.

LX Extirpated from our region with remote chance of rediscovery. Presumably highly sensitive.

LH Hybrid between two native species. Usually not scored unless highly stable and behaves like a species (e.g. *Equisetum x nelsonii*)

L+ Exotic. Not native to TRCA jurisdiction. Includes hybrids between a native species and an exotic

L+? Origin uncertain or disputed, i.e. may or may not be native.

The City of Mississauga's Natural Areas Survey (2015) indicates there are a total of 196 floral species identified at the southeastern portion of our study area. They estimate that 41.33% of the flora are introduced plant species with a native FQI of 35.19 and native mean coefficient of 3.28, which are low values.

3.3.1.2.1 Locally Rare Flora and Species

No locally rare flora were documented in the TRCA database. All species were L3 to L5 under the TRCA classification system indicating species of urban concern. The City of Mississauga's Natural Areas Survey (NAS) (2015) indicates that 32 of the flora species in ET01 are Species of Conservation Concern in the Credit Valley Conservation (CVC) district (tier 1-3). Note the study area is in TRCA jurisdiction, not CVC, however the Mississauga NAS lists the CVC flora and fauna codes. Common Hop (*Humulus lupulus*) found in ET01 is a plant species considered rare in Mississauga.

3.3.1.2.2 Species at Risk

Butternut (*Juglans cinerea*), an endangered tree species, is identified in the City of Mississauga's Natural Areas Survey (2015) as being in ET01 located in the vegetation communities south of highway 407 and hydro corridor. This is a species commonly encountered in the urban areas of the Region.

No plant species at risk were found in the TRCA flora data.

No plant species at risk were observed during the field investigations by LGL in 2019 or 2020.

3.3.2 LGL Vegetation Description 2019/2020

The geographic extent, composition, structure, and function of vegetation communities identified through background review within the study area were identified and confirmed through air photo interpretation and in-season site visits. The site was investigated on May 22 and May 27, 2019 and October 16, 2020 to assess the natural and semi-natural vegetation communities, verify TRCA and Mississauga NIA mapping as well as to screen for Species at Risk (SAR) occurring within the study area. A plant list and a description of the general structure of vegetation confirmed through the field investigation are provided below. Plant species status was reviewed for Ontario (Oldham 2013) and TRCA status (2012). Vascular plant nomenclature follows Newmaster et al. (2008).

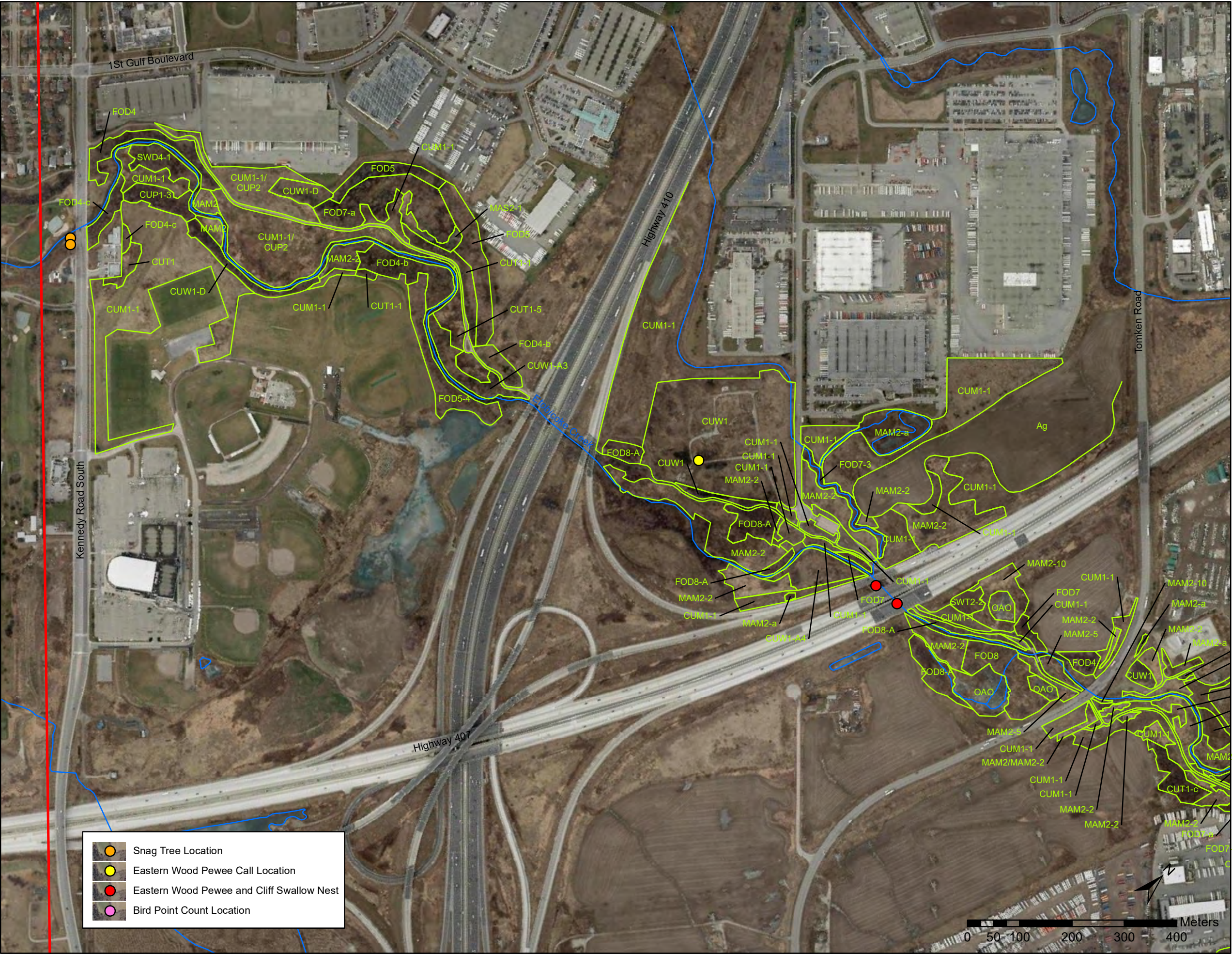
3.3.2.1 Vegetation Communities.

The majority of the study area has been altered from its original native communities for agricultural purposes and now for recreational and industrial use. Many of the communities have resulted from or are being maintained by disturbance. Restoration efforts through woody species plantings and invasive species control is evident throughout the study area. Natural and semi-natural (cultural) communities were mainly observed along the entire length of the Etobicoke Creek Valley. Valley slopes are steep in sections while other areas have a gradual slope towards the creek. A paved recreational trail occurs along the entire length of the study area. Wildlife habitat features/structures have been installed on either side of the 407 Highway along the creek as part of a restoration project -pit and mound, deep pools and down logs and woody debris.

TRCA ELC data and mapping information and the Natural Areas Inventory data and mapping was used to assess and refine the vegetation features observed in the field where appropriate. Minor refinements from LGL's field review of TRCA and Mississauga's NAI vegetation mapping included changing cultural communities that have matured to forest communities, meadows to plantation as a result of restoration planting, and meadows to cultural woodlands.

A total of 11 Ecological Land Classification (ELC) vegetation ecosite communities have been identified within the study area; and these communities are further classified into a total of 33 communities due to changes in vegetation dominance. Naturalized vegetation communities are associated with the slopes and floodplain of Etobicoke Creek and described a deciduous forest (FOD4, FOD4-b, FOD4-c, FOD5, FOD5-2, FOD5-4, FOD7, FOD7-a, FOD7-2, FOD7-3, FOD7-4, FOD8, FOD8-A), cultural meadow (CUM1-1), cultural woodland (CUW1, CUW1-A3, CUW1-A4, CUW1-D), cultural thicket (CUT1, CUT1-1, CUT1-5, CUT1-c), cultural plantation (CUP2, CUP-3-3), cultural savannah (CUS), deciduous swamp (SWD4-1), thicket swamp (SWT2-2), meadow marsh (MAM2-2, MAM2-5, MAM2-10, MAM2-a), shallow marsh (MAS2-1) and open water aquatic (OAO1). LGL updated ELC communities are shown in Figure 4. A description of these communities is provided in Table 3.

None of the vegetation communities are considered rare or uncommon in the province of Ontario.



LEGEND

- Study Area
- ELC Communities (LGL)
- Watercourse (LIO)
- Waterbody (LIO)
- ELC Communities
- FOD4

 Dry-Fresh Deciduous Forest
- FOD4-b

 Dry-Fresh Manitoba Maple Deciduous Forest
- FOD4-c

 Dry-Fresh Black Locust Deciduous Forest
- FOD5

 Dry-Fresh Sugar Maple-Beech Deciduous Forest
- FOD5-2

 Dry-Fresh Sugar Maple Deciduous Forest
- FOD5-4

 Dry-Fresh Sugar Maple - Ironwood Deciduous Forest
- FOD7

 Fresh-Moist Lowland Deciduous Forest
- FOD7-2

 Fresh-Moist Ash Lowland Deciduous Forest
- FOD7-3

 Fresh-Moist Willow Lowland Deciduous Forest
- FOD7-4

 Fresh-Moist Black Walnut Lowland Deciduous Forest
- FOD7-a

 Fresh-Moist Manitoba Maple Lowland Deciduous Forest
- FOD8

 Fresh-Moist Poplar-Sassafras Deciduous Forest
- FOD8-A

 Fresh-Moist Cottonwood Coastal Deciduous Forest
- MAM2

 Mineral Meadow Marsh
- MAM2-2

 Reed-canary Grass Mineral Meadow Marsh
- MAM2-5

 Narrow-leaved Sedge Mineral Meadow Marsh
- MAM2-10

 Forb Mineral Meadow Marsh
- MAM2-a

 Common Reed Mineral Meadow Marsh
- MAM2-1

 Cattail Mineral Shallow Marsh
- SWD4-1

 Willow Mineral Deciduous Swamp
- SWT2-2

 Willow Mineral Thicket Swamp
- OAo

 Open Aquatic
- CUP

 Plantation
- CUP1-3

 Black Walnut Deciduous Plantation
- CUP2

 Mixed Plantations
- CUP3-3

 Scotch Pine Coniferous Plantation
- CUS

 Cultural Savannah
- CUT1

 Mineral Cultural Thicket
- CUT1-1

 Sumac Deciduous Thicket
- CUT1-5

 Raspberry Deciduous Thicket
- CUT1-c

 Exotic Deciduous Thicket
- CUW1

 Mineral Cultural Woodland
- CUW1-A3

 Native Deciduous Successional Woodland
- CUW1-A4

 Fresh-Moist Cottonwood Tall Treed Woodland
- CUW1-D

 Hawthorn Successional Woodland
- CUM1-1

 Dry-Moist Old Field Meadow
- Ag

 Agriculture
- M

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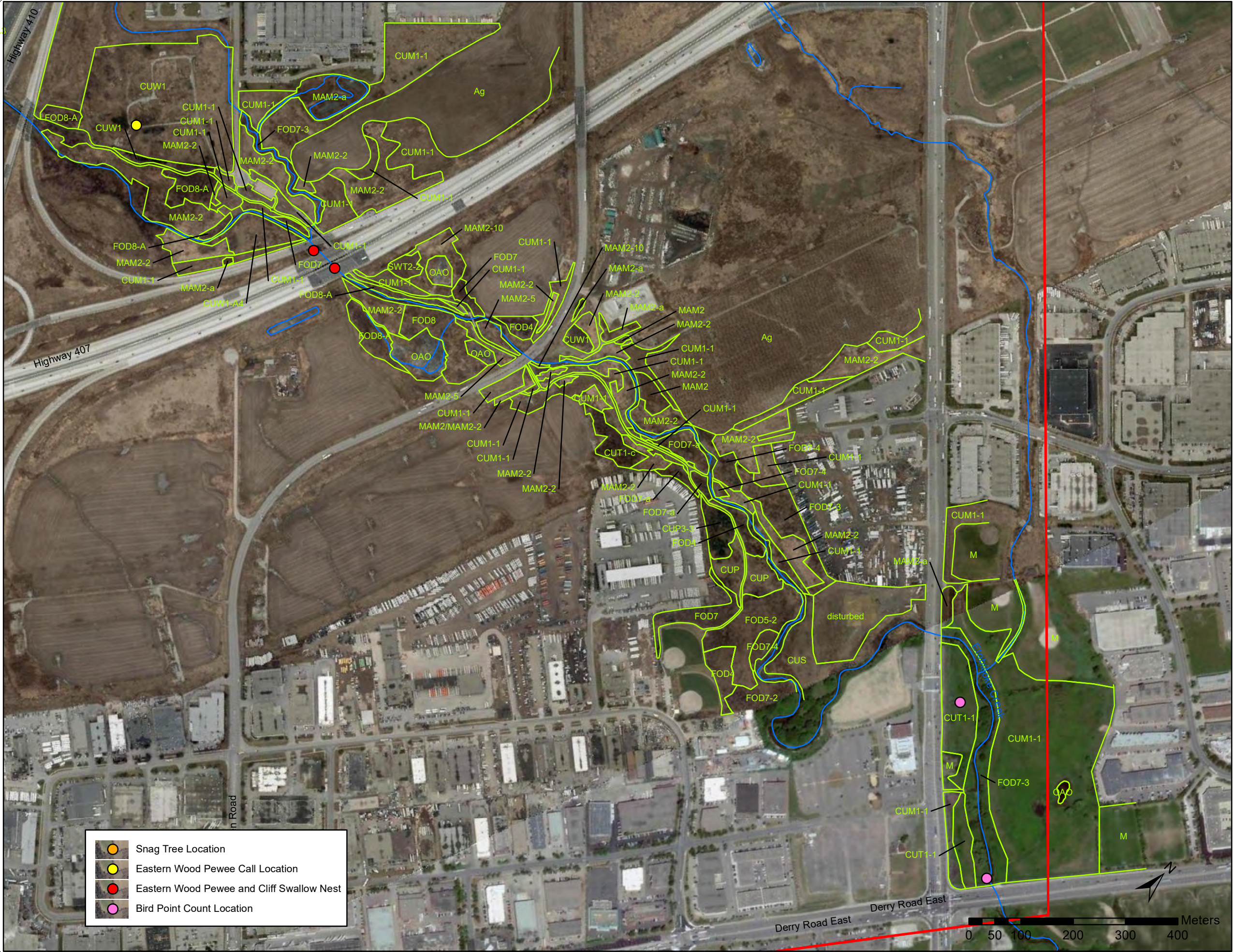
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Etobicoke Creek Trunk Sewer Improvements and Upgrades Existing Conditions



Project	TA8907	Figure	4a
Date	August 2020	Prepared By:	KC
Scale	1:7,000	Verified By:	AHF



LEGEND

- Study Area
- ELC Communities (LGL)
- Watercourse (LIO)
- Waterbody (LIO)

- ELC Communities**
- FOD4 Dry-Fresh Deciduous Forest
 - FOD4-b Dry-Fresh Manitoba Maple Deciduous Forest
 - FOD4-c Dry-Fresh Black Locust Deciduous Forest
 - FOD5 Dry-Fresh Sugar Maple-Beech Deciduous Forest
 - FOD5-2 Dry-Fresh Sugar Maple Deciduous Forest
 - FOD5-4 Dry-Fresh Sugar Maple - Ironwood Deciduous Forest
 - FOD7 Fresh-Moist Lowland Deciduous Forest
 - FOD7-2 Fresh-Moist Ash Lowland Deciduous Forest
 - FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest
 - FOD7-4 Fresh-Moist Black Walnut Lowland Deciduous Forest
 - FOD7-a Fresh-Moist Manitoba Maple Lowland Deciduous Forest
 - FOD8 Fresh-Moist Poplar-Sassafras Deciduous Forest
 - FOD8-A Fresh-Moist Cottonwood Coastal Deciduous Forest
 - MAM2 Mineral Meadow Marsh
 - MAM2-2 Reed-canary Grass Mineral Meadow Marsh
 - MAM2-5 Narrow-leaved Sedge Mineral Meadow Marsh
 - MAM2-10 Forb Mineral Meadow Marsh
 - MAM2-a Common Reed Mineral Meadow Marsh
 - MAM2-1 Cattail Mineral Shallow Marsh
 - SWD4-1 Willow Mineral Deciduous Swamp
 - SWT2-2 Willow Mineral Thicket Swamp
 - OAO Open Aquatic
 - CUP Plantation
 - CUP1-3 Black Walnut Deciduous Plantation
 - CUP2 Mixed Plantations
 - CUP3-3 Scotch Pine Coniferous Plantation
 - CUS Cultural Savannah
 - CUT1 Mineral Cultural Thicket
 - CUT1-1 Sumac Deciduous Thicket
 - CUT1-5 Raspberry Deciduous Thicket
 - CUT1-c Exotic Deciduous Thicket
 - CUW1 Mineral Cultural Woodland
 - CUW1-A3 Native Deciduous Successional Woodland
 - CUW1-A4 Fresh-Moist Cottonwood Tall Treed Woodland
 - CUW1-D Hawthorn Successional Woodland
 - CUM1-1 Dry-Moist Old Field Meadow
 - Ag Agriculture
 - M Manicured

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**Etobicoke Creek Trunk
Sewer Improvements
and Upgrades
Existing Conditions**



Project	TA8907	Figure	4b
Date	August 2020	Prepared By:	KC
Scale	1:7,000	Verified By:	AHF

Table 3: Summary of Ecological Land Classification Vegetation Communities 2020.

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Natural/Semi Natural	FOD4	Dry-Fresh Deciduous Forest	Canopy: Black Walnut (<i>Juglans nigra</i>), Manitoba Maple (<i>Acer negundo</i>), Norway Maple (<i>Acer platanoides</i>), White Pine (<i>Pinus strobus</i>), White Elm (<i>Ulmus americana</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Non common species dominant (4). Dry to fresh soils with rapid to well drainage. Community occurs on the tableland and along valley slopes.
Natural/Semi Natural	FOD4-b	Manitoba Maple Dry-Fresh Deciduous Forest	Canopy: Manitoba Maple (<i>Acer negundo</i>), Norway Maple (<i>Acer platanoides</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Non common species dominant (4). Manitoba Maple dominant (b) Dry to fresh soils with rapid to well drainage. Community occurs on the tableland and along valley slopes.
Natural/Semi Natural	FOD4-c	Black Locust Dry-Fresh Deciduous Forest	Canopy: Black Locust (<i>Robinia pseudo-acacia</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Non common species dominant (4). Black Locust Dominant (-c) Dry to fresh soils with rapid to well drainage. Community occurs on the tableland and along valley slopes.
Natural/Semi Natural	FOD5	Dry Sugar Maple Deciduous Forest	Canopy: Sugar Maple (<i>Acer saccharum ssp. saccharum</i>) dominant	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Sugar Maple dominant (5). Dry to fresh soils with rapid to well drainage. Community occurs on the tableland and along valley slopes.

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Natural/Semi Natural	FOD5-2	Dry-Fresh Sugar Maple –Beech	Canopy: Sugar Maple (<i>Acer saccharum ssp. saccharum</i>) and American Beech (<i>Fagus grandifolia</i>) dominant with some occasional White Ash (<i>Fraxinus americana</i>), Black Cherry (<i>Prunus serotina</i>) and Ironwood (<i>Ostrya virginiana</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Sugar Maple dominant (5). Dry to fresh soils with rapid to well drainage. Community occurs on the tableland and along valley slopes.
Natural/Semi Natural	FOD5-4	Dry-Fresh Sugar Maple – Ironwood Deciduous Forest	Canopy: Sugar Maple (<i>Acer saccharum ssp. saccharum</i>) with Ironwood (<i>Ostrya virginia</i>) dominant with White Elm (<i>Ulmus americana</i>), Basswood (<i>Tilia americana</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Sugar Maple dominant (5) and Ironwood (-4). Dry to fresh soils with rapid to well drainage. Community occurs on the tableland and along valley slopes.
Natural/Semi Natural	FOD7	Lowland Deciduous Forest	Canopy: Manitoba maple dominant Willow (<i>Salix x rubens</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moist to fresh soils with well to poor drainage typically occurring in the lower slope, bottomlands such as floodplains (7).
Natural/Semi Natural	FOD7-A	Fresh – Moist Manitoba Lowland Deciduous Forest	Canopy: Manitoba maple dominant Willow (<i>Salix x rubens</i>), White Elm (<i>Ulmus americana</i>) Bitternut Hickory (<i>Carya cordiformis</i>), Siberian Elm (<i>Ulmus pumila</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moist to fresh soils with well to poor drainage typically occurring in the lower slope, bottomlands such as floodplains (7). Dominated by Manitoba Maple (-a).

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Natural/Semi Natural	FOD7-2	Fresh – Moist Lowland Deciduous Forest	Canopy: Red Ash (<i>Fraxinus pennsylvanica</i>) and Black Walnut (<i>Juglans nigra</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moist to fresh soils with well to poor drainage typically occurring in the lower slope, bottomlands such as floodplains (7). Dominated by red ash (-2).
Natural/Semi Natural	FOD7-3	Fresh – Moist Willow Lowland Deciduous Forest	Canopy: Willow (<i>Salix sp.</i>) dominant with Manitoba Maple (<i>Acer negundo</i>), Black Walnut (<i>Juglans nigra</i>).	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moist to fresh soils with well to poor drainage typically occurring in the lower slope, bottomlands such as floodplains (7). Dominated by Willow (3)
Natural/Semi Natural	FOD7-4	Fresh – Moist Black Walnut Lowland Deciduous Forest	Canopy: Black Walnut (<i>Juglans nigra</i>) dominant with Manitoba Maple (<i>Acer negundo</i>).	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moist to fresh soils with well to poor drainage typically occurring in the lower slope, bottomlands such as floodplains (7). Dominated by Black Walnut (-4).
Natural/Semi Natural	FOD8	Fresh – Moist Poplar Forest Deciduous Forest	Canopy: dominated by Willow (<i>Salix sp.</i>) and Eastern Cottonwood (<i>Populus deltoides</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moist to fresh soils with well to poor drainage typically occurring in the lower slope, bottomlands such as floodplains (7).
Natural/Semi Natural	FOD8-A	Fresh – Moist Poplar Forest Deciduous Forest	Canopy: dominated by Easter Cottonwood (<i>Populus deltoides</i>)	Tree cover > 60 % (FO). Deciduous trees > 75 % of canopy cover (D). Moist to fresh soils with well to poor drainage typically occurring in the lower slope, bottomlands such as floodplains. Poplar

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Cultural Plantation	CUP	Cultural Plantation	Canopy: Scotts Pine (<i>Pinus sylvestris</i>), White Oak (<i>Quercus alba</i>), Red Maple (<i>Acer rubrum</i>), Silver Maple (<i>Acer saccharinum</i>), Eastern White Cedar (<i>Thuja occidentalis</i>), Hackberry (<i>Celtis occidentalis</i>), Black Walnut (<i>Juglans nigra</i>), Red Oak (<i>Quercus rubra</i>)	Tree cover and shrub cover >60 % (CUP). This community can occur on a wide range of soil moisture regimes. Area planted with native plants throughout a meadow. Community resulting from, or maintained by, anthropogenic-based influences. Topography varied due past site clearing. Plant density and species dominance varies throughout the site. Contains a mixture of native species.
Cultural Plantation	CUP2	Cultural Plantation	Canopy: mixture of recently planted tree species White Cedar (<i>Thuja occidentalis</i>), White Pine (<i>Pinus tremuloides</i>), Trembling Aspen (<i>Populus tremuloides</i>), Red Oak (<i>Quercus rubra</i>) etc.	Tree cover and shrub cover >60 % (CUP). This community can occur on a wide range of soil moisture regimes. Mixed plantation (2) Area planted with native plants throughout a meadow. Community resulting from, or maintained by, anthropogenic-based influences. Topography varied due past site clearing. Plant density and species dominance varies throughout the site.

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Cultural Plantation	CUP3-3	Cultural Plantation	Canopy dominated by Scotts Pine (<i>Pinus sylvestris</i>)	Tree cover and shrub cover >60 % (CUP). This community can occur on a wide range of soil moisture regimes. Coniferous plantation (3) Area planted with non-native plants throughout a meadow. Community resulting from, or maintained by, anthropogenic-based influences. Topography varied due past site clearing. Plant density and species dominance varies throughout the site.
Cultural Meadow	CUM1-1	Dry-Moist Meadow	Ground Cover: Canada Goldenrod (<i>Solidago canadensis</i>), Lance-leaved Aster (<i>Aster lanceolatus</i>), Awnless Brome (<i>Bromus inermis ssp. inermis</i>), Orchard Grass (<i>Dactylis glomerata</i>)	Tree cover and shrub cover < 25 % (CUM). This community can occur on a wide range of soil moisture regimes (Dry-Moist) (1-1). Native forb dominant. Community resulting from, or maintained by, anthropogenic-based influences. Topography varied due past site clearing. Plant density and species dominance varies throughout the site. Contains a mixture of native species.
Cultural Thicket	CUT1	Dogwood Cultural Thicket	Canopy: Dogwood (<i>Cornus</i> sp)	Tree cover < 25 % and shrub cover > 25 % (CUT). Mineral Cultural Thicket (1) resulting from, or maintained by, anthropogenic-based influences. Community located off property.

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Cultural Thicket	CUT1-1	Sumac Cultural Thicket	Canopy: Staghorn Sumac (<i>Rhus hirta</i>), Russian Olive (<i>Eleagnus angustifolia</i>), Trembling Aspen (<i>Populus tremuloides</i>), White Spruce (<i>Picea glauca</i>), Silver Maple (<i>Acer saccharinum</i>)	Tree cover < 25 % and shrub cover > 25 % (CUT). Mineral Cultural Thicket (1) dominated by sumac (1) resulting from, or maintained by, anthropogenic-based influences. Community located off property.
Cultural Thicket	CUT1-5	Native Deciduous Sapling Regeneration Thicket	Canopy: Raspberry (<i>Rubus ideus ssp. strigosus</i>)	Tree cover < 25 % and shrub cover > 25 % (CUT). Mineral Cultural Thicket (1) dominated by Raspberry(5) resulting from, or maintained by, anthropogenic-based influences. Community located off property.
Cultural Thicket	CUT1-c	Exotic Deciduous Thicket	Canopy: regenerating young English Hawthorn (<i>Crataegus monogyna</i>) and Common Buckthorn (<i>Rhamnus cathartica</i>)	Tree cover < 25 % and shrub cover > 25 % (CUT). Mineral Cultural Thicket (1) dominated by Exotic resulting from, or maintained by, anthropogenic-based influences. Community located off property.
Cultural Savannah	CUS1	Black Walnut Cultural Savannah	Canopy: Dominate by Black Walnut (<i>Juglans nigra</i>)	Cultural communities (CU). Tree cover between 25% and 35% (S). This community can occur on a wide range of soil moisture regimes (1). Community resulting from, or maintained by, anthropogenic-based influences.

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Cultural Woodland	CUW1	Cultural Woodland	Canopy: Manitoba Maple (<i>Acer negundo</i>), Norway Maple (<i>Acer platanoides</i>), Russian Olive (<i>Eleagnus angustifolia</i>), Blue Spruce (<i>Picea pungens</i>)	Cultural communities (CU). Tree cover between 35 and 60 % (W). This community can occur on a wide range of soil moisture regimes (Dry-Moist) (1) dominated by native deciduous species (A3). Community resulting from, or maintained by, anthropogenic-based influences. Trees naturalized following disturbance and abandonment of the property.
Cultural Woodland	CUW1-A3	Native Deciduous Successional Woodland	Canopy: composed of a mixture of tree species which include Eastern Cottonwood (<i>Populus deltoides</i>), White Elm (<i>Ulmus americana</i>), Sugar Maple (<i>Acer saccharum</i>), Black Cherry (<i>Prunus serotina</i>)	Cultural communities (CU). Tree cover between 35 and 60 % (W). This community can occur on a wide range of soil moisture regimes (Dry-Moist) (1) dominated by native deciduous species (A3). Community resulting from, or maintained by, anthropogenic-based influences. Trees naturalized following disturbance and abandonment of the agricultural practices. Occurs between the wetland and silt fencing on the property.
Cultural Woodland	CUW1-A4	Native Deciduous Successional Woodland	Canopy: Eastern Cottonwood (<i>Populus deltoides</i>)	Cultural communities (CU). Tree cover between 35 and 60 % (W). This community can occur on a wide range of soil moisture regimes (Dry-Moist) (1) dominated by native deciduous species (A3). Community resulting from, or maintained by, anthropogenic-based influences. Trees naturalized following disturbance and abandonment of the agricultural practices.

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Cultural Woodland	CUW1-D	Hawthorn Successional Woodland	Canopy: composed of a mixture of tree species which include English Hawthorn (<i>Crataegus monogyna</i>) and Black Walnut (<i>Juglans nigra</i>)	Cultural communities (CU). Tree cover between 35 and 60 % (W). This community can occur on a wide range of soil moisture regimes (Dry-Moist) (1) dominated by hawthorn species (b). Community resulting from, or maintained by, anthropogenic-based influences. Trees naturalized or planted on a slope following site disturbance. Topography altered in this area. May have been remnant of an old plantation.
Wetland – Natural/semi Natural Deciduous Swamp	SWD4-1	Willow Mineral Deciduous Swamp	Canopy: Willow (<i>Salix X rubens</i>) dominant with Manitoba Maple (<i>Acer negundo</i>) and occasional Black Walnut	Seasonally flooded and dominated by hydrophytic trees and shrubs >25% cover (SW). Deciduous tree species > 75% (D). Dominated by less common species (4) Willow dominant (-1).
Wetland – Natural/semi Natural Thicket Swamp	SWT2-2	Willow Thicket Swamp	Canopy: dominated by willow	Seasonally flooded and dominated by hydrophytic trees and shrubs >25% cover (SW). Tree cover < 25 % and shrub cover > 25% (T) Mineral soil (2) Willow dominant (-2).
Wetland – Natural Meadow Marsh	MAM2-2	Reed Canary Meadow Marsh	Ground Cover: dominated by Reed Canary Grass (<i>Phalaris arundinacea</i>)	Seasonally flooded and dominated by emergent hydrophytic macrophytes (MAM). Mineral soil (2). Dominated by Reed Canary Grass (2) Associated with the east side of the floodplain of Etobicoke Creek.

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Wetland – Natural Meadow Marsh	MAM2-5	Narrow-leaved Sedge Mineral Meadow Marsh	Ground Cover: narrow leaved sedges	Seasonally flooded and dominated by emergent hydrophytic macrophytes (MAM). Mineral soil (2). Dominated by narrow sedge (5) Associated with the floodplain of Etobicoke Creek.
Wetland – Natural Meadow Marsh	MAM2-5	Forb Mineral Meadow Marsh	Ground Cover: dominated by Tall White Aster (<i>Aster lanceolatus</i>), Canada Goldenrod (<i>Solidago canadensis</i>)	Seasonally flooded and dominated by emergent hydrophytic macrophytes (MAM). Mineral soil (2). Dominated by forb species (5) Associated with the floodplain of Etobicoke Creek.
Wetland – Natural Meadow Marsh	MAM2-a	Common Reed Mineral Meadow marsh	Ground Cover: dominated by Common Reed (<i>Phragmites australis</i>)	Seasonally flooded and dominated by emergent hydrophytic macrophytes (MAM). Mineral soil (2). Dominated by Common Reed (a) Associated with the east side of the floodplain of Etobicoke Creek.
Wetland – Cultural Shallow Marsh	MAS2-1	Cattail Mineral Shallow Marsh	Ground Cover: dominated by Narrow Leaved Cattail (<i>Typha angustifolia</i>).	Variably flooded, with standing water for much or all of the growing season and dominated by emergent hydrophytic macrophytes (MAS) Mineral Soil (2). Dominated by Narrow-leaved Cattail (-1b) Restored/enhanced pond as part of restoration efforts by TRCA.

Terrestrial Community	ELC Code	ELC Vegetation Community	Species Association	Community Characteristic
Wetland – Cultural Open Water Marsh	OA01	Open water aquatic	No macrophyte vegetation cover.	Permanently flooded area water greater than >2 m in depth (OA0) Consists of a dug feature on the adjacent property. A berm occurs along the west, south and eastern side of the pond.

3.3.2.2 Vegetation

A total of 172 vascular plant species have been recorded within the study area. Eighty-eight (88) or 49% of the total flora are identified as native to Ontario and eighty-four (84) plants of the total flora are considered introduced and non-native to Ontario. The vascular plant list of species identified during the field investigations is present in Appendix C.

No species regulated under the Ontario Endangered Species Act, 2007 were encountered during the botanical investigations. Fourteen species have local status or considered a species of conservation concern with TRCA and they are presented in Table 4.

Table 4: Provincially and Locally Significant Species within the Etobicoke Creek Study Area.

Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
<i>Viburnum nudum</i> <i>var. cassinoides</i>	northern wild raisin	G5	S5			L2
<i>Picea glauca</i>	white spruce	G5	S5			L3
<i>Physocarpus</i> <i>opulifolius</i>	ninebark	G5	S5			L3, R
<i>Hamamelis</i> <i>virginiana</i>	Witch-hazel	G5	S5			L3
<i>Ilex verticillate</i>	Winterberry	G5	S5			L3
<i>Quercus alba</i>	White Oak	G5	S5			L3
<i>Panicum virgatum</i>	Switch Grass	G5	S4			L3
<i>Iris versicolor</i>	Multi-coloured Blue-flag	G5	S5			L3
<i>Myosotis laxa</i>	smaller forget-me- not	G5	S5			L4
<i>Allium tricoccum</i>	Wild Leek	G5	S5			L4
<i>Pinus strobus</i>	eastern white pine	G5	S5			L4
<i>Tsuga canadensis</i>	eastern hemlock	G5	S5			L4
<i>Thuja occidentalis</i>	eastern white cedar	G5	S5			L4
<i>Podophyllum</i> <i>peltatum</i>	may-apple	G5	S5			L4
<i>Carya cordiformis</i>	bitternut hickory	G5	S5			L4
<i>Fagus grandifolia</i>	American beech	G5	S5			L4

Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
<i>Quercus macrocarpa</i>	bur oak	G5	S5			L4
<i>Populus grandidentata</i>	large-tooth aspen	G5	S5			L4
<i>Geum aleppicum</i>	yellow avens	G5	S5			L4
<i>Acer saccharinum</i>	silver maple	G5	S5			L4
<i>Osmorhiza claytonii</i>	woolly sweet-cicely	G5	S5			L4,U
<i>Oenothera biennis</i>	common evening-primrose	G5	S5			L5,U
<i>Sambucus nigra</i> ssp. <i>canadensis</i>	common elderberry	G5	S5			L5,U

3.4 Wildlife and Wildlife Habitat

Wildlife communities and habitat are described through a combination of background data and through observations made on site by LGL.

3.4.1 Background Information

Available background information from TRCA, Ontario Nature Reptile and Amphibian Atlas (Ontario Nature 2019), and, the Ontario Breeding Bird Atlas (OBBA) (Bird Studies Canada 2006) was reviewed for the broader project area (Appendix B). A summary of the TRCA fauna, Ontario Nature Atlas and OBBA data is provided in Appendix B. Background data from the TRCA is from within the study area. Data from the atlases contains bird, reptile, and amphibian data for an area 10km², therefore, while these species have some potential to be found in a larger area, there may not be available habitat for them on site.

A total of 11 reptile and amphibian species were identified in the greater study area based on data from TRCA, OBBA, Ontario Nature Reptile Atlas and LGL surveys. A total of 65 bird species were noted by TRCA and LGL. An additional 20 bird species were noted on eBird; however they may be up to 10km away and are not confirmed in the study area. A total of 8 mammal species were noted in the study area by TRCA and LGL.

The City of Mississauga's Natural Areas Survey (2015) indicates there are a total of 47 birds, 3 mammals, 2 dragonflies, and 4 butterfly species present in Natural Area ET01.

The fauna is considered typical for urban natural areas.

3.4.2 Field Investigation

A roaming breeding bird survey was conducted by LGL within the study area on May 27, 2019 and on June 7, 2019, with a focus on the alternative routes proposed in the feasibility study. An additional point count breeding bird investigation were completed in 2020 on June 29 and July 7 in order to cover the southeast corner of the study area, near Dixie Road and Derry Road. A field visit was also completed on May 26, 2020 at dawn to screen for SAR grassland birds in the agricultural field west of Tomken Road, north of Highway 407. Weather conditions were optimal, with low winds and clear skies (see Table 5).

Table 5: Weather Conditions for Wildlife Surveys.

Survey Date	Start time	Temperature	Precipitation	Wind Speed	Sky
May 27 2019		15°C	None	0-5km/h	Clear
June 7 2019		15°C	None	0-5km/h	Clear
May 26 2020	6:45am	15°C	None	0-5km/h	Clear
June 29 2020	6:20am	19°C	None	0-5km/h	Clear
July 7 2020	7:38am	25°C	None	0 km/h	Clear

In addition to the bird survey, incidental wildlife observations were completed through visual and auditory observations as well as indirect incidental observations (i.e. tracks, scat, and scents). A list of all species documented by LGL within the study area is provided in Appendix B, locations for several species noted are found in Figure 4. A summary of LGL field observations and wildlife habitat characterization are included in the following sections.

3.4.2.1 Wildlife

A total of 60 wildlife species were documented during the field investigation by LGL, including five mammal species, one amphibian species, 53 bird species, and one invertebrate.

Most of the bird species observed are considered migratory and are regulated under the Migratory Birds Convention Act (MBCA), while Blue Jay (*Cyanocitta cristata*) is regulated under the Fish and Wildlife Conventions Act (FWCA). The Beaver (*Castor canadensis*), Muskrat (*Ondatra zibethica*) and Raccoon (*Procyon lotor*) are regulated as furbearers under the FWCA. Gray Squirrel (*Sciurus carolinensis*), and White-tailed Deer

(*Odocoileus virginianus*) are game species under the FWCA. Some of the observed species are not under any legislative protection: American Crow (*Corvus brachyrhynchos*); House Sparrow (*Passer domesticus*); and, Red-winged Blackbird (*Agelaius phoeniceus*).

3.4.2.2 Wildlife Habitat

With the study area being in a predominantly industrial setting, the natural areas associated with Etobicoke Creek provide some of the main habitat for wildlife in the area. The Etobicoke Creek valley and its associated natural areas provide a wildlife corridor through the area with the movement of mammal species evident through tracks under the bridge structures. The structures themselves provide nesting habitat for Cliff Swallow (*Petrochelidon pyrrhonota*) and Eastern Phoebe (*Sayornis phoebe*), with several active nests of both species observed during field investigations (see Figure 4). While the structures are also suitable for other species, such as Barn Swallow (*Hirunda rustica*), none were observed. The Etobicoke Creek valley provides a variety of habitat types including mature deciduous forest, secondary forest, open riparian habitats and wetlands. There are two constructed wetlands between the 407 ETR and Tomken Road that are being used by a variety of wildlife including amphibians, birds and mammals. In several areas, the habitat has been enhanced/restored through tree plantings, wetland construction and invasive species removal. Several bat boxes were noted attached to large trees in the forested area in the study area, south of Etobicoke Creek. Several trees with cavities suitable for roosting bats were also located within the forested areas throughout the study area, as well as along Kennedy Road. Two large Red Oak (*Quercus rubra*) on the south west side of the Kennedy Road bridge over Etobicoke Creek had candidate bat habitat cavities (see Appendix A for photos and Figure 4 for location).

In addition to the natural habitats associated with the creek valley, open, human-made habitats exist for species that prefer edges and/or open field habitats. This includes a golf course located to the west of Kennedy Road, sports fields located to the south of the Etobicoke Creek valley, fallow lands associated with the old wastewater treatment plant north of the creek valley and agricultural lands.

3.4.3 Species at Risk and Locally Rare Species

Two wildlife species at risk was noted during LGL's field investigations, Eastern Wood-pewee (*Contopus virens*) and Monarch (*Danaus plexippus*) are both species of Special Concern in Ontario under the Endangered Species Act, 2007. A review of TRCA fauna

data, Ontario Nature, iNaturalist, OBBA, and eBird data identifies the potential presence of the following species at risk in a 10 km square that includes our study area (Table 6).

Table 6: Species at Risk in the Greater Study Area.

Common Name	Scientific Name	Status under ESA	Source
Bank Swallow	<i>Riparia riparia</i>	Threatened	TRCA
Barn Swallow	<i>Hirundo rustica</i>	Threatened	EBird
Bobolink	<i>Dolichonyx orzivorus</i>	Threatened	TRCA
Chimney Swift	<i>Chaetura pelagica</i>	Threatened	TRCA
Eastern Meadowlark	<i>Sturnella magna</i>	Threatened	TRCA
Eastern Wood-pewee	<i>Contopus virens</i>	Special Concern	LGL, TRCA, EBird
Jefferson Salamander	<i>Ambystoma jeffersonianum</i>	Endangered	Reptile Atlas
Monarch	<i>Danaus plexippus</i>	Special Concern	LGL
Snapping Turtle	<i>Chelydra serpentina</i>	Special Concern	Reptile Atlas
Wood Thrush	<i>Hylocichla mustelina</i>	Special Concern	EBird

City of Mississauga's Natural Areas Survey (2015) indicates that 22 of the bird species in ET01 are Species of Conservation Concern in the Credit Valley Conservation district (Tier 1-3).

A summary of all potential species at risk identified through this screening, their habitat requirements, and further discussion of their potential to be onsite is provided in Section 4.0.

3.5 Aquatic Habitat and Communities

3.5.1 Background Information

Etobicoke Creek Flows through the study area. The current sewer alignment follows its length through the study area. Etobicoke Creek is an urban creek that has been degraded (TRCA 2010) and efforts have been made to restore the creek in recent years. The Etobicoke Creek watershed drains an area of approximately 211km². Its headwaters are in the Oak Ridges Moraine and it flows through Brampton and Mississauga eventually flowing into Lake Ontario. The creek flows through a series of riffles and pools through the study area (see photo Appendix). Several smaller tributaries area also found in the study area (see Figure 5 and photo Appendix). While the watershed has many barriers to fish movement, the West Branch is relatively well connected (TRCA 2010). Table 7 provides a summary of fish species in the vicinity of the study area and Figure 5 indicates locations of fish surveys. A total of 21 fish

species are present within Etobicoke Creek in the study area. Species include mainly warmwater baitfish such as Bluntnose Minnow (*Pimephales notatus*) and Fathead Minnow (*P. promelas*). Etobicoke Creek is managed as a warmwater system.

The Etobicoke Creek Watershed Report Card (TRCA 2018) rated the water quality a D, which is poor. The grade is based on benthic invertebrate sampling, and concentrations of Total Phosphorus as well as *Escherichia coli* levels. While chloride levels are not used as a measurement in the water quality rating, they are known to be high in the watershed.

3.5.2 Species at Risk

Etobicoke Creek and its tributaries are not reported to support any aquatic species at risk. Etobicoke Creek was once habitat for Redside Dace (*Clinostomus elongatus*) however the species is considered extirpated from the area (DFO 2019).

Table 7: Summary of Fish Species – Background Review.

Common Name	Scientific Name	Thermal Regime/Tolerance ¹	Status	SARO/ SARA	Etobicoke Creek in study area (AU-006-ETO) ⁷	Etobicoke Creek downstream of study area (AU- 007-ETO) ⁸	Tributaries of Etobicoke Creek along Kennedy Road (AU005-ETO) ⁹	Etobicoke Creek in study area northwest of 410 and 407 (EC008WM) ¹⁰	Etobicoke Creek in study area northeast of 410 and 407 (EC-KV1) ¹¹	Etobicoke Creek downstream of study area, south of Derry Road (EC007WM) ¹²
Bluntnose Minnow	<i>Pimephales notatus</i>	warmwater/ intermediate	G5, S5		X	X	X	X	X	X
Brook Stickleback	<i>Culaea inconstans</i>	coolwater/ intermediate ²	G5, S5		X	X		X		X
Brown Bullhead	<i>Ameiurus nebulosus</i>	warmwater/ intermediate	G5, S5							X
Central Stoneroller	<i>Campostoma anomalum</i>	warmwater/ intermediate	G5, S5					X	X	X
Common Shiner	<i>Luxilus cornutus</i>	coolwater/ intermediate ⁴	G5, S5		X	X	X		X	X
Creek Chub	<i>Semotilus atromaculatus</i>	coolwater/ intermediate ⁵	G5, S5		X	X	X	X	X	X
Western Blacknose Dace	<i>Rhinichthys obtusus</i>	coolwater/ intermediate	G5, SNR		X	X	X	X	X	X
Emerald Shiner	<i>Notropis atherinoides</i>	coolwater/ intermediate ⁴	G5, S5		X					
Fantail Darter	<i>Etheostoma flabellare</i>	coolwater/ intolerant	G5, S4		X					
Fathead Minnow	<i>Pimephales promelas</i>	warmwater/ tolerant	G5, S5		X	X		X		X
Golden Shiner	<i>Notemigonus crysoleucas</i>	coolwater/ intermediate ⁴	G5, S5				X			X
Green Sunfish	<i>Lepomis cyanellus</i>	warmwater/ tolerant	G5, S5					X		X
Johnny Darter	<i>Etheostoma nigrum</i>	coolwater/tolerant ⁶	G5, S5		X	X	X	X	X	X
Longnose Dace	<i>Rhinichthys cataractae</i>	coolwater/ intermediate	G5, S5		X	x	X	X		X
Northern hog Sucker	<i>Hypentelium nigricans</i>	warmwater/ intermediate	G5, S4		X			X		
Pumpkinseed	<i>Lepomis gibbosus</i>	warmwater/ intermediate	G5, S5							X
Rainbow Darter	<i>Etheostoma caeruleum</i>	coolwater/ intolerant	G5, S4		X			X	X	X
Rock Bass	<i>Ambloplites rupestris</i>	coolwater/ intermediate	G5, S5		X	X				x

Common Name	Scientific Name	Thermal Regime/Tolerance ¹	Status	SARO/ SARA	Etobicoke Creek in study area (AU-006-ETO) ⁷	Etobicoke Creek downstream of study area (AU-007-ETO) ⁸	Tributaries of Etobicoke Creek along Kennedy Road (AU005-ETO) ⁹	Etobicoke Creek in study area northwest of 410 and 407 (EC008WM) ¹⁰	Etobicoke Creek in study area northeast of 410 and 407 (EC-KV1) ¹¹	Etobicoke Creek downstream of study area, south of Derry Road (EC007WM) ¹²
Spotfin Shiner	<i>Cyprinella spiloptera</i>	warmwater/intermediate	G5, S4				X			
Spottail Shiner	<i>Notropis hudsonius</i>	coolwater/intermediate	G5, S5		X					
White Sucker	<i>Catostomus commersonii</i>	coolwater/tolerant	G5, S5		X	X	X		X	

Table 7 Legend

¹ Eakins, R. J. 2012. Ontario Freshwater Fishes Life History Database. Version 4.24. On-line database. (<http://www.ontariofishes.ca>), accessed 31 May 2019

² Tolerant of low DO but intolerant of turbidity. Usually only species found in marginal environments.

³ Intolerant of turbidity, siltation, pollution

⁴ Tolerant of turbidity

⁵ Tolerant of pollution, low DO, moderately intolerant of turbidity

⁶ Tolerant of many organic/inorganic pollutants, but moderately tolerant of turbidity

⁷ AU-006-ETO in Figure 4, Source: MNRF LIO data

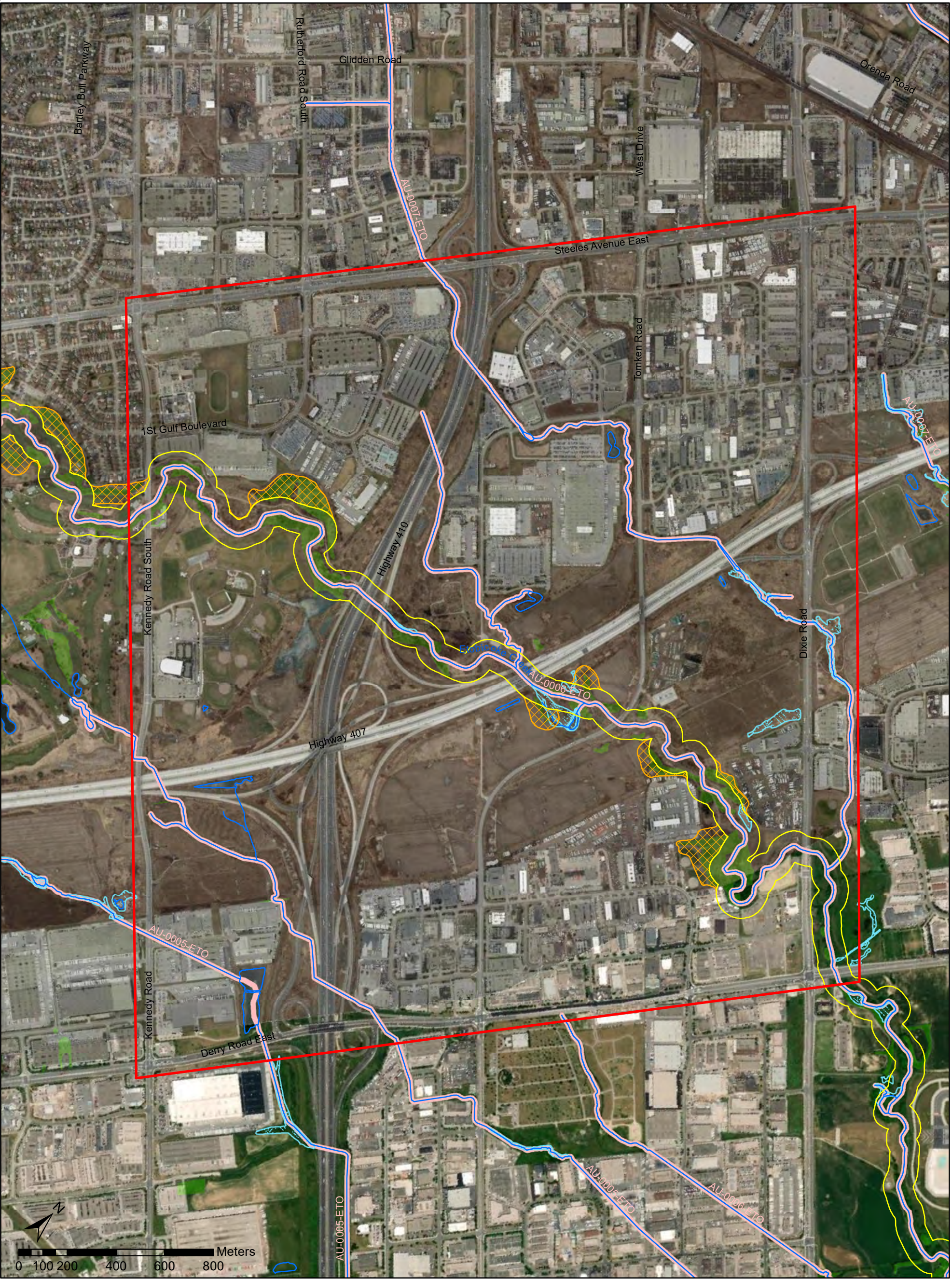
⁸ AU-007-ETO in Figure 4, Source: MNRF LIO data

⁹ AU-005-ETO in Figure 4, Source: MNRF LIO data

¹⁰ EC008WM in Figure 4, Source: TRCA data

¹¹ EC-KV1 in Figure 4, Source: TRCA data

¹² EC007WM in Figure 4, Source: TRCA data



Etobicoke Creek Trunk Sewer Improvements and Upgrades
Background Data Review (LIO)

- Study Area
- Greenbelt - Urban River Valley
- NHS (Undifferentiated) - Growth Plan for the Greater Golden Horseshoe
- Unevaluated Wetland
- Wooded Area
- Watercourse
- Waterbody
- Aquatic Resource Area Summary Thermal Regime
- Warm

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Scale	1:15,000	Verified By	AHF

4.0 Species at Risk Summary

The *Endangered Species Act* (2007) was administered by the MNRF when this project was initiated. It is now administered by the MECP (as of April 1, 2019). A project screening was sent to the MECP on May 10th, 2019. Their response was advice on how to complete a self-screening of the study area as well as a list of resources with available information. A table of potential SAR species (see Table 8) has been compiled using information from various sources such as TRCA database, NHIC, OBBA, eBird, Ontario Nature, iNaturalist, Ontario Reptile and Amphibian Atlas, DFO Aquatic SAR Mapping as well as LGL's spring 2019/2020 surveys.

Table 8: Species at Risk Screening Summary Matrix

Type	Species	LGL Surveys Spring 2019	MNRF NHIC (May 2019)	TRCA data	DFO SAR Mapping (2019)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird (2 stations near study area)	MNRF Screening (List for Mississauga)	ESA Designation	Habitat	Potential for Habitat/Screening Conducted by LGL	Results of Screening	Mitigation Recommendations for Detailed Design
Vegetation	American Chestnut (<i>Castanea dentata</i>)								X	SARO – Endangered	Generally found in deciduous or mixed forests with well drained soils. Most often found in the Carolinian zone in Ontario.	Forest habitat found in study area. ELC conducted within the vicinity of the worksite. No known background records for this species.	LGL did not observe any specimens within the study area.	No further recommendations.
Vegetation	Butternut (<i>Juglans cinerea</i>)								X	SARO – Endangered	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldom, on dry, rocky and sterile soils. In Ontario, the Butternut Generally grows alone or in small groups in deciduous forests as well as in hedgerows	Potential habitat found in study area. ELC and arborist survey conducted within the vicinity of the worksite. Reported to occur in study area.	LGL did not observe any specimens within the study area. High potential to occur.	This stage of project review may not detect individuals of the species. Project solutions should continue to consider this species as potentially present under the study area is assessed at detailed design. It cannot be ruled out at this time. It would be detected at the permitting and approvals phasing such as through a site specific arborist assessment, tree protection plan or environmental impact study in support of TRCA permits.
Bird	Barn Swallow (<i>Hirundo rustica</i>)							X	X	SARO – Threatened	Prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	No nesting sites were observed in study area, nor were any barn swallows observed foraging in the area.	Breeding bird survey conducted, none observed.	No removal of built structures with the potential to function as nesting habitat are anticipated at this time. No further recommendations.

Type	Species	LGL Surveys Spring 2019	MNRF NHIC (May 2019)	TRCA data	DFO SAR Mapping (2019)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird (2 stations near study area)	MNRF Screening (List for Mississauga)	ESA Designation	Habitat	Potential for Habitat/Screening Conducted by LGL	Results of Screening	Mitigation Recommendations for Detailed Design
Bird	Bank Swallow (<i>Riparia riparia</i>)			X					X	SARO – Threatened	Nests in the vertical surfaces of silt and sand substrates. Often these surfaces are found on the banks of waterbodies or gravel pits.	Potential nesting site in the study area on bank of Etobicoke Creek just downstream of the pedestrian bridge. Bank at this location is vertical and composed of silt, clay, and shale. No nest excavations or species documented in area.	Breeding bird survey conducted; no Bank Swallows observed. Observed by TRCA in study area.	Mitigation measures during construction may include recommendations on soil stockpile height to be kept to 2.5m or lower to reduce potential for cavity nesters. No further action recommended at this time.
Bird	Bobolink (<i>Dolichonyx oryzivorus</i>)			X					X	SARO – Threatened	This species occurs in tallgrass prairies, open meadows, and fallow agricultural fields. It is also often found in hay fields.	Suitable habitat for this species found in study area in agricultural fields and meadows.	Breeding bird survey conducted, none observed. Recorded by TRCA in study area in data dated 2002-2005.	No further recommendations at this time.
Bird	Chimney Swift (<i>Chaetura pelagica</i>)								X	SARO – Threatened	Historically found in deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys.	No buildings with chimneys suitable for nesting found in study area.	Breeding bird survey conducted, none observed.	No removal of built structures with the potential to function as habitat are anticipated. No further recommendations.

Type	Species	LGL Surveys Spring 2019	MNRF NHIC (May 2019)	TRCA data	DFO SAR Mapping (2019)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird (2 stations near study area)	MNRF Screening (List for Mississauga)	ESA Designation	Habitat	Potential for Habitat/Screening Conducted by LGL	Results of Screening	Mitigation Recommendations for Detailed Design
Bird	Common Nighthawk (<i>Chordeiles minor</i>)								X	SARO – Special Concern	Open habitats with little to no plants. Examples included rock barrens, forest clearings, and logged areas.	Some suitable habitat for this species found in study area. No background records in eBird for the study area.	Breeding bird survey conducted, none observed although a crepuscular species and not detected during standard surveys.	No further recommendations at this time.
Bird	Eastern Meadowlark (<i>Sturnella magna</i>)		X	X					X	SARO – Threatened	This species occurs in tallgrass prairies, open meadows, and fallow agricultural fields.	Suitable habitat for this species found in study area in agricultural fields and meadows.	Breeding bird survey conducted, none observed. Recorded by TRCA in study area in data dated 2002-2005.	No further recommendations at this time.
Bird	Eastern Wood-Pewee (<i>Contopus virens</i>)	X		X				X	X	SARO – Special Concern	Mixed and deciduous forests in the mid-canopy layer near forest clearings and edges. The forests usually have little understory vegetation.	Suitable habitat for this species found in forests in study area.	Breeding bird survey conducted, observed by LGL in 2019 and considered present in study area. Also recorded by TRCA, and noted in eBird.	Avoid forest habitat communities where feasible. If required, tree and vegetation clearing should ensure compliance of the Migratory Bird Convention Act which identifies timing restrictions for clearing during breeding bird season (April 1- August 31) for nesting Zone C2.
Bird	Least Bittern (<i>Ixobrychus exilis</i>)								X	SARO – Threatened	Found in wetland habitats with open water. They prefer cattail marshes.	No habitat for this species found in the study area. The wetlands in the area are not large enough and do not provide suitable habitat.	Breeding bird survey conducted, none observed. None recorded on E-bird for the study area.	No further recommendations.

Type	Species	LGL Surveys Spring 2019	MNRF NHIC (May 2019)	TRCA data	DFO SAR Mapping (2019)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird (2 stations near study area)	MNRF Screening (List for Mississauga)	ESA Designation	Habitat	Potential for Habitat/Screening Conducted by LGL	Results of Screening	Mitigation Recommendations for Detailed Design
Bird	Peregrine Falcon (<i>Falco peregrinus</i>)								X	SARO – Special Concern	Nesting sites include cliff faces and ledges as well as the ledges on tall buildings, bridges, and other anthropogenic structures. They have also been found nesting in quarries and open pit mines	Urban-type suitable habitat for this species found in study area.	Breeding bird survey conducted, none observed.	No further recommendations.
Bird	Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)								X	SARO – Special Concern	Open woodlands and woodland edges. Sometimes found in cemeteries, parks and golf courses.	Suitable habitat for this species found in forests and woodlands in study area	Breeding bird survey conducted, none observed.	No further recommendations.
Bird	Short-eared Owl (<i>Asio flammeus</i>)								X	SARO – Special Concern	Open areas like grasslands, and marshes. Nests on the ground.	Suitable habitat for this species found in study area in meadows, though potentially too small.	Breeding bird survey conducted, none observed.	No further recommendations.
Bird	Wood Thrush (<i>Hylocichla mustelina</i>)							X	X	SARO – Special Concern	Mature deciduous and mixed woods. Nests regularly in Sugar Maple and American Beech.	Suitable habitat for this species found in forests in study area.	Breeding bird survey conducted, none observed.	No further recommendations.
Reptile and amphibian	Eastern Ribbonsnake (<i>Thamnophis sauritus</i>)								X	SARO – Special Concern	They are a semi aquatic species. Their habitat is forests near water, particularly marsh habitat within a forest.	Habitat for this species found in the study area, in Etobicoke Creek and associated woodlands and wetlands.	None found	Recommend using ESCs and wildlife fencing to keep wildlife out of construction area.
Reptile and amphibian	Jefferson Salamander (<i>Ambystoma jeffersonianum</i>)					X			X	SARO – Endangered	They are found in woodland and forest habitats and breed in vernal pools.	Habitat for this species not found in the study area. This record may be from up to 10km away.	None found	Recommend using ESCs and wildlife fencing to keep wildlife out of construction area.

Type	Species	LGL Surveys Spring 2019	MNRF NHIC (May 2019)	TRCA data	DFO SAR Mapping (2019)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird (2 stations near study area)	MNRF Screening (List for Mississauga)	ESA Designation	Habitat	Potential for Habitat/Screening Conducted by LGL	Results of Screening	Mitigation Recommendations for Detailed Design
Reptile and amphibian	Northern Map Turtle (<i>Graptemys geographica</i>)								X	SARO – Special Concern	They inhabit rivers and lakes that support molluscs (for prey).	Habitat for this species not found in the study area.	None found	Recommend using ESCs and wildlife fencing to keep wildlife out of construction area.
Reptile and amphibian	Snapping Turtle (<i>Chelydra serpentina</i>)					X			X	SARO – Special Concern	Aquatic setting such as lakes, ponds, bays and inlets. This is a highly aquatic species but may leave the water to seek out new aquatic habitats or to lay eggs.	Habitat for this species found in the study area, in Etobicoke Creek and associated wetlands.	None found	Recommend using ESCs and wildlife fencing to keep wildlife out of construction area.
Mammal	Eastern Small-footed Bat (<i>Myotis leibii</i>)								X	SARO – Endangered	Overwintering habitat: Caves and mines Maternal Roosts: Caves, tree cavities, rock outcrops, bridges and buildings	No potential for hibernacula identified. Potential for maternal roots in forests and open grown trees.	Candidate roost trees identified in forest/woodland communities and along Kennedy Road	Recommend targeted bat and bat habitat surveys to be completed in areas with potential tree removals at the Detailed Design Stage to confirm site specific mitigation requirements. Apply timing window for tree clearing to protect maternity roosting.
Mammal	Little Brown Bat (<i>Myotis lucifugus</i>)								X	SARO – Endangered	Overwintering habitat: Caves and mines that remain above 0. Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	No potential for hibernacula identified. Potential for maternal roots in forests and open grown trees.	Candidate roost trees identified in forest/woodland communities and along Kennedy Road	Recommend targeted bat and bat habitat surveys to be completed in areas with potential tree removals at the Detailed Design Stage to confirm site specific mitigation requirements. Apply timing window for tree clearing to protect maternity roosting.
Mammal	Northern Long Eared Bat (<i>Myotis septentrionalis</i>)								X	SARO – Endangered	Overwintering habitat: Caves and mines that remain above 0. Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh) with cavities and crevices. Occasionally found in structures (attics, barns etc.)	No potential for hibernacula identified. Potential for maternal roots in forests and open grown trees.	Candidate roost trees identified in forest/woodland communities and along Kennedy Road	Recommend targeted bat and bat habitat surveys to be completed in areas with potential tree removals at the Detailed Design Stage to confirm site specific mitigation requirements. Apply timing window for tree clearing to protect maternity roosting.

Type	Species	LGL Surveys Spring 2019	MNRF NHIC (May 2019)	TRCA data	DFO SAR Mapping (2019)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird (2 stations near study area)	MNRF Screening (List for Mississauga)	ESA Designation	Habitat	Potential for Habitat/Screening Conducted by LGL	Results of Screening	Mitigation Recommendations for Detailed Design
Mammal	Tri-Coloured Bat (<i>Perimyotis subflavus</i>)								X	SARO – Endangered	Overwintering habitat: Caves and mines that remain above 0. Maternal Roosts: Often associated with clusters of dead leaves in large diameter Oak or Maple trees	No potential for hibernacula identified. Potential for maternal roots in forests and open grown trees.	Candidate roost trees identified in forest/woodland communities and along Kennedy Road	Recommend targeted bat and bat habitat surveys to be completed in areas with potential tree removals at the Detailed Design Stage to confirm site specific mitigation requirements. Apply timing window for tree clearing to protect maternity roosting.
Invertebrates	Monarch (<i>Danaus plexippus</i>)	X								SARO – Special Concern	Summer habitat in Ontario includes meadows and open areas where Milkweed grows. Caterpillars feed on milkweed, while adults feed on a variety of wildflowers	Suitable habitat found in study area for nectaring and breeding. No staging habitat identified. No overwintering habitat in Canada.	Adult Monarch observed in study area.	Minimize milkweed removals. Include milkweed in restoration plantings. No additional mitigation recommended at this time.

5.0 Potential Impacts

Potential impacts identified are in the form of vegetation and tree removals and aquatic habitat impacts for construction along and/or in the vicinity of the Etobicoke Creek Trunk Sewer. For the purposes of the Natural Sciences Report, the following short list of alternatives were considered:

- Alternative 1: Etobicoke Creek Alignment
- Alternative 2: CAA Alignment
- Alternative 3: Kennedy Road Alignment
- Alternative 4: Deep Trunk Alignment

As described in Section 3.4 above, wildlife and wildlife habitat in the project area is considered tolerant to human disturbance given the proximity to and ongoing influence of urban landscapes. There are potential direct impacts to wildlife habitat from vegetation removal within the construction disturbance limits sewer alignment for all four alternatives, and preliminary mitigation measures are recommended accordingly.

Impacts to aquatic habitat are also identified as all alignments have crossings of Etobicoke Creek and/or tributaries. Potential impacts can be mitigated through appropriate mitigation measures such as erosion and sediment control measures and use of tunneling technologies. It is assumed that crossings for alternatives 3 and 4 will be achieved with tunneling technologies, with some open cutting with alternative 4. Crossing methods have not been determined for alternatives 1 and 2.

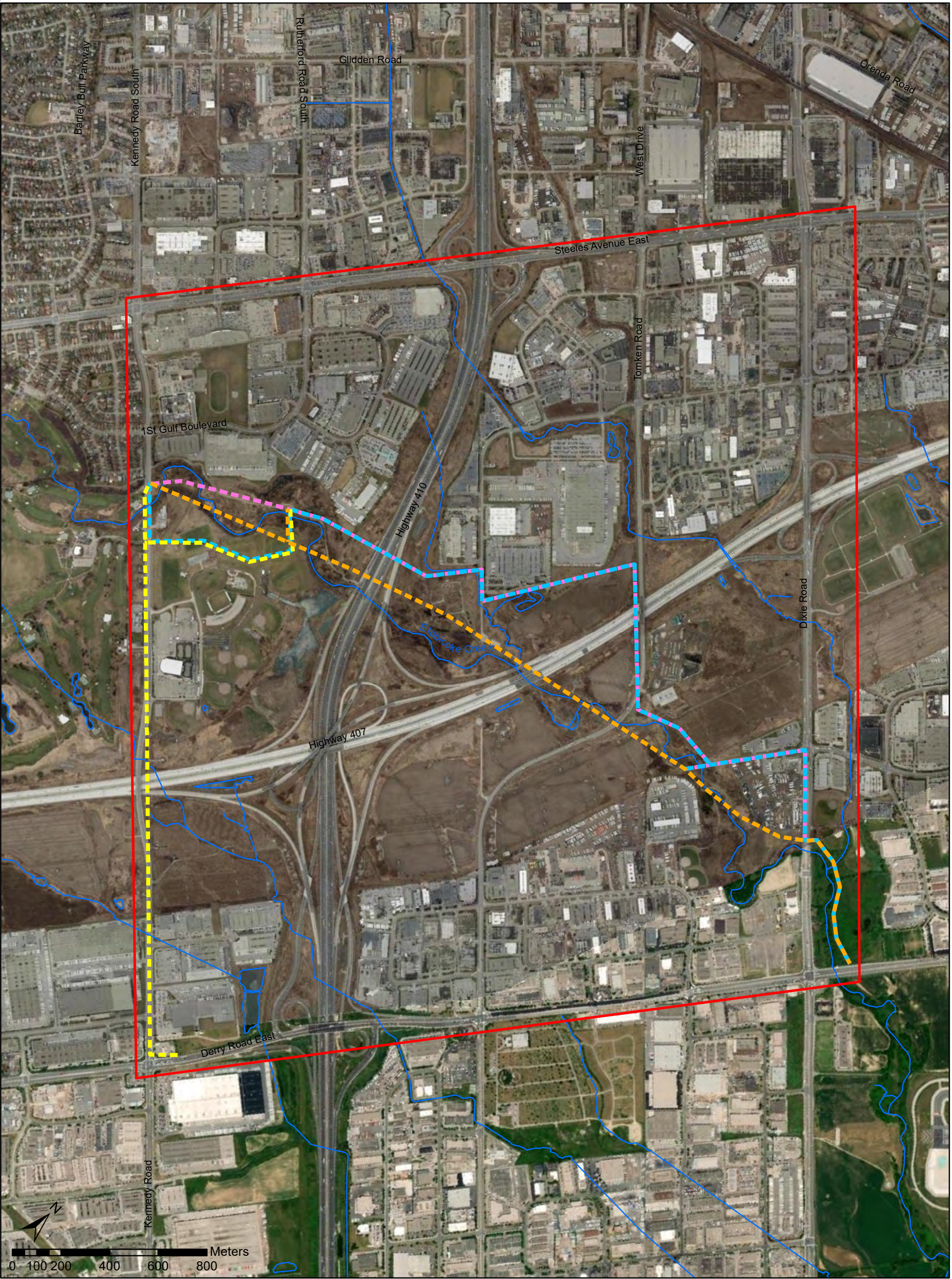
Based on previous consultation with the MNRF and MECP on similar projects, the potential for SAR bat impacts can be mitigated through the application of timing windows for tree clearing activities, minimizing the extent of tree removals on the project and bat habitat enhancement included in restoration efforts (See Figure 6 and Table 9).

A summary of the potential natural heritage impacts is provided in Table 9. This includes impacts to terrestrial habitat and aquatic habitat as well as Species at Risk.

The evaluation has determined that the Kennedy Road alignment would have the least impacts to natural heritage as there are fewer watercourse crossings, less vegetation and tree removals. The Etobicoke Creek alignment would have the most impacts due to vegetation removals required for open cut construction and shaft locations.

Table 9: Natural Heritage Evaluation of Alternatives Perspective.

Alternative	1 Etobicoke Creek	2 CAA	3 Kennedy Road	4 Deep Trunk
Vegetation Impacts	Vegetation impacts and tree removals anticipated along open cut areas and shaft locations.	Vegetation impacts and tree removals anticipated along open cut areas and shaft locations.	Potential for impacts to or removal of some street trees at shaft locations.	Potential for impacts to or removal of some street trees at shaft locations.
Wildlife Impacts	Impacts to wildlife habitat from vegetation and tree removals.	Impacts to wildlife habitat from vegetation and tree removals.	Impacts to wildlife habitat from tree removals at shaft locations.	Impacts to wildlife habitat from vegetation and tree removals at shaft locations.
Aquatic Impacts	3 crossings of Etobicoke Creek and 2 crossings of tributaries as well as approximately 600m of pipe installed along banks of Etobicoke Creek and 500m of pipe installed along banks of tributary.	3 crossings of Etobicoke Creek and 2 crossings of tributaries as well as approximately 600m of pipe installed along banks of Etobicoke Creek and 500m of pipe installed along banks of tributary.	2 crossings of Etobicoke Creek and 2 crossings of tributaries.	7 crossings of Etobicoke Creek and 2 crossings of tributaries as well as approximately 600m of pipe installed along banks of Etobicoke Creek.
SAR Impacts	Potential to impact Eastern Wood-Pewee Habitat. Potential to impact bat maternal roosting habitat.	Potential to impact Eastern Wood-Pewee Habitat. Potential to impact bat maternal roosting habitat.	Potential to impact bat maternal roosting habitat.	Potential to impact Eastern Wood-Pewee Habitat. Potential to impact bat maternal roosting habitat.
Evaluation	4	3	1	2



Etobicoke Creek Trunk Sewer Improvements and Upgrades
Feasibility Study Alternative Alignments

- Study Area
- Alternative 1: Etobicoke Creek Alignment
- Alternative 2: CAA Alignment
- Alternative 3: Kennedy Road Alignment
- Alternative 4: Deep Trunk Alignment
- Watercourse (LIO)
- Waterbody (LIO)

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Project	TA8907	Figure	6
Date	October 2020	Prepared By	KC
Scale	1:15,000	Verified By	AHF

5.1 Proposed Mitigation

LGL has reviewed the information available for the project against the natural heritage information compiled to date above to make the following recommendations to reduce impacts on natural features through project design. As additional project information is provided and additional details are understood, this mitigation is subject to be changed or updated.

A standalone Erosion and Sediment Control (ESC) Plan should be developed at the Detailed Design stage and implemented for the site that minimizes risk of sediment transport into adjacent retained vegetation communities or to the aquatic habitat of Etobicoke Creek during all phases of the project. This plan should include these mitigation measures:

- Use of tunneling technologies to cross watercourses;
- Use measures to isolate the construction area;
- Effective ESC measures shall be installed before starting work to prevent the entry of sediment into the watercourse or adjacent areas. Inspect regularly during the course of construction and conduct regular maintenance and repairs as necessary;
- Clearly identify stockpiling and staging areas; and,
- A plan to dispose of any water accumulated onsite from dewatering or pooled stormwater.

Other mitigation measures should include:

- Minimize vegetation and tree removals through facility, construction, staging and access design;
- Minimize construction area to the extent possible;
- Use appropriate tree protection measures for any work around tree resources within the project area to help protect trees identified to be retained;
- Use previously disturbed areas or areas outside of the Natural Heritage System for construction laydown and staging to the extent possible;

- No vegetation removal should occur between April 1 and August 30 (for zone C2) of any given year in order to ensure compliance with the Migratory Birds and Convention Act;
- No tree removal or pruning of any candidate bat snag trees within the forest/woodland habitat should occur during the maternal roosting period for bats. Note, this timing window is weather dependant and should be confirmed by MECP once further project details are known but typically extends until the end of September. Bat impacts should be screened with the MECP through an IGF submission at Detail Design to ensure compliance with the ESA
- Locate site maintenance, vehicle washing and refuelling stations where contaminants are handled off site and at least 30 m away from any watercourses or wetlands; and,
- Ensure that a Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is on-site at all times for implementation in event of an accidental spill during construction. An emergency spill kit shall be kept on site. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

6.0 Recommendations for Next Steps

Etobicoke Creek and its floodplain are regulated by the TRCA under Ontario Regulation 166/06 Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Most of the study area along alternatives 1,2,and 4 are within TRCA regulated areas while alternative 3 passes through some regulated areas (Table 10). Table 10 provides a summary of the permitting requirements for the project.

Table 10: Summary of Permitting Requirements.

Agency	Potential Permits and Approvals
TRCA	Permit under Ontario Regulation 166/06: Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Compensation for impacts in regulated areas may be required according to TRCA policies.

Agency	Potential Permits and Approvals
MECP	<p>Permits or approvals may be required under the ESA (2007). Confirm timing windows for tree removal/pruning to avoid maternal roosting period for SAR bats.</p> <p>Any species at risk that have potential to be impacted should be included in an IGF submission to the MECP to confirm permit requirements and compliance with the ESA.</p>
DFO	<p>Fisheries Act Authorization may be required for any in-water works. A Self-Assessment process can be followed if in-water works are avoided.</p> <p>Should in-water works be required, a Request for Review will need to be submitted to the DFO. If it is determined that a Harmful Alteration, Disruption, or Destruction (HADD) of fish or fish habitat could occur, the project may require a Fisheries Act Authorization.</p>
Municipality	<p>City of Brampton and City of Mississauga Tree By-laws (Brampton Tree Preservation By-law 317-2012, Brampton Woodland Conservation by-law 316-2012, Mississauga Private Tree Protection By-law 254-12, etc.). Tree protection planning should be considered for trees to ensure trees that are to be retained are suitably protected during construction.</p>

7.0 Summary and Conclusion

This report summarizes the background review and LGL field work done to date. The review of the short list of alternatives is based mainly on the alignment only as details and locations for construction methodology such as shaft sites have not been determined. It is assumed though that alternatives 3 and 4 will use tunneling technologies for watercourse crossings. It has also been assumed that most of the construction of alternatives 1 and 2 will be achieved with open cut, with some tunneling sections. With these assumptions, we are assessing the crossings of the watercourses as open cut crossing without mitigation for the evaluation of alternatives. Crossing the watercourses using tunneling technologies would mitigate some of the impacts, however these project details are not yet available.

The potential for SAR and SAR habitat to date has been based on a variety of background data sources and direct field observation by LGL.

It is evident that Etobicoke Creek corridor represents the largest natural heritage constraint in the project area. Alternatives that utilize road right of ways would minimize the potential for impacts to the creek corridor. Despite its urban influence, it supports a surprising number of urban tolerant species that are important to the natural heritage of the watershed. Restoration works have been undertaken along the creek corridor, and if feasible, the natural and restored areas of the creek are recommended for avoidance as they now comprise the natural heritage system of Etobicoke Creek.

8.0 References

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Appendix A Photo Appendix.

Photo Appendix



Photo 1: High exposed banks southeast of pedestrian bridge, potential for Bank Swallow habitat.



Photo 2: Monarch Butterfly.



Photo 3: Bat houses attached to Trees in Forested area.

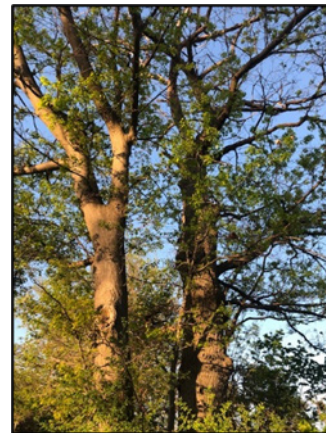


Photo 4: Street trees on Kennedy Road with cavities suitable for bat maternal roosting.



Photo 5: Etobicoke Creek at 407.



Photo 6: Etobicoke Creek downstream of Tomken Road.

Photo Appendix



Photo 7: Wheat field in north east section of the study area.



Photo 8: Tributary of Etobicoke Creek at Tomken Road.



Photo 9: Debris high on bank of tributary, indicating high flows.



Photo 10: Etobicoke Creek at potential crossing location facing downstream.

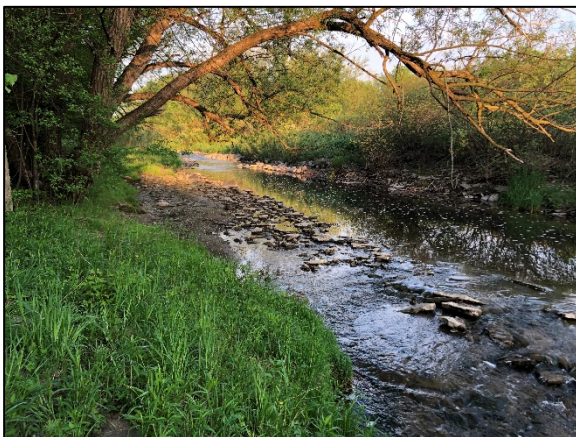


Photo 11: Etobicoke Creek at potential crossing location facing upstream.



Photo 12: Exposed banks upstream of proposed crossing area.

Appendix B Wildlife Species List.

Appendix B Wildlife Species List

Type	Scientific Name	Common Name	TRCA Fauna data	Nature Counts eBird	OBBA (2001-2005)	Ontario Nature Reptile Atlas	LGL Data (Visit 1)	LGL Data (Visit 2)	LGL Data (both visits 1 and 2)	LGL Data (Visit 3)	LGL Data (Visit 4)	G-Rank	S-Rank	Schedule	COSEWIC	SARA	SARO	FWCA	MBCA	TRCA
Amphibian	<i>Bufo americanus</i>	American Toad				X		X				G5	S5							L4
Amphibian	<i>Plethodon cinereus</i>	Eastern Red-backed Salamander				X						G5	S5					P		L3
Amphibian	<i>Hyla versicolor</i>	Gray Treefrog				X						G5	S5					P		L2
Amphibian	<i>Lithobates clamitans</i>	Green Frog				X			X			G5	S5							L4
Amphibian	<i>Ambystoma jeffersonianum</i>	Jefferson Salamander				X						G4	S2	Schedule 1	END	THR	END	P		L1
Amphibian	<i>Lithobates pipiens</i>	Northern Leopard Frog				X						G5	S5		NAR					L3
Amphibian	<i>Pseudacris crucifer</i>	Spring Peeper				X						G5	S5							L2
Bird	<i>Anas rubripes</i>	American Black Duck						X				G5	S4						X	L3
Bird	<i>Corvus brachyrhynchos</i>	American Crow		X					X			G5	S5B							L5
Bird	<i>Carduelis tristis</i>	American Goldfinch		X					X			G5	S5B						X	L5
Bird	<i>Falco sparverius</i>	American Kestrel		X								G5	S4					P		L4
Bird	<i>Setophaga ruticilla</i>	American Redstart							X			G5	S5B						X	L4
Bird	<i>Turdus migratorius</i>	American Robin		X	X				X			G5	S5B						X	L5
Bird	<i>Scolopax minor</i>	American Woodcock	X	X			X					G5	S4B						X	L3
Bird	<i>Icterus galbula</i>	Baltimore Oriole		X	X				X			G5	S4B						X	L5
Bird	<i>Riparia riparia</i>	Bank Swallow	X									G5	S4B	No Schedule	THR		THR		X	L3
Bird	<i>Hirundo rustica</i>	Barn Swallow		X								G5	S4B	No Schedule	THR		THR		X	L4
Bird	<i>Ceryle alcyon</i>	Belted Kingfisher	X				X					G5	S4B					P		L4
Bird	<i>Mniotilta varia</i>	Black and White Warbler							X			G5	S5B						X	L2
Bird	<i>Dendroica fusca</i>	Blackburnian Warbler						X				G5	S5B						X	L3
Bird	<i>Poecile atricapillus</i>	Black-capped Chickadee		X					X			G5	S5						X	L5
Bird	<i>Dendroica caerulescens</i>	Black-throated Blue Warbler		X								G5	S5B						X	L3
Bird	<i>Cyanocitta cristata</i>	Blue Jay		X					X			G5	S5					P		L5
Bird	<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher							X			G5	S4B						X	L4
Bird	<i>Dolichonyx oryzivorus</i>	Bobolink	X									G5	S4B	No Schedule	THR		THR		X	L3
Bird	<i>Certhia americana</i>	Brown Creeper		X								G5	S5B						X	L4
Bird	<i>Molothrus ater</i>	Brown-headed Cowbird		X					X			G5	S4B							L5
Bird	<i>Branta canadensis</i>	Canada Goose		X			X					G5	S5						X	L5
Bird	<i>Bombycilla cedrorum</i>	Cedar Waxwing		X					X			G5	S5B						X	L5
Bird	<i>Chaetura pelagica</i>	Chimney Swift		X								G5	S4B,S4N	Schedule 1	THR	THR	THR		X	L4
Bird	<i>Spizella passerina</i>	Chipping Sparrow		X					X			G5	S5B						X	L5
Bird	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow							X			G5	S4B						X	L5
Bird	<i>Quiscalus quiscula</i>	Common Grackle		X	X				X			G5	S5B							L5
Bird	<i>Geothlypis trichas</i>	Common Yellowthroat	X	X					X			G5	S5B						X	L4
Bird	<i>Accipiter cooperii</i>	Cooper's Hawk		X								G5	S4		NAR			P		L4
Bird	<i>Junco hyemalis</i>	Dark-eyed Junco		X								G5	S5B						X	
Bird	<i>Phalacrocorax auritus</i>	Double-crested Cormorant		X								G5	S5B		NAR					L3
Bird	<i>Picoides pubescens</i>	Downy Woodpecker							X			G5	S5						X	L5
Bird	<i>Tyrannus tyrannus</i>	Eastern Kingbird	X	X					X	X		G5	S4B						X	L4
Bird	<i>Sturnella magna</i>	Eastern Meadowlark	X									G5	S4B	No Schedule	THR		THR		X	L3
Bird	<i>Sayornis phoebe</i>	Eastern Phoebe							X			G5	S5B						X	L5
Bird	<i>Contopus virens</i>	Eastern Wood Pewee	X	X			X					G5	S4B	No Schedule	SC		SC		X	L4
Bird	<i>Sturnus vulgaris</i>	European Starling		X	X				X	X	X	G5	SNA							L+
Bird	<i>Regulus satrapa</i>	Golden-crowned Kinglet		X								G5	S5B						X	L3
Bird	<i>Dumetella carolinensis</i>	Gray Catbird	X	X					X			G5	S4B						X	L4
Bird	<i>Ardea herodias</i>	Great Blue Heron		X							X	G5	S4						X	L3
Bird	<i>Myiarchus crinitus</i>	Great Crested Flycatcher	X	X								G5	S4B						X	L4
Bird	<i>Bubo virginianus</i>	Great Horned Owl		X								G5	S4					P		L4
Bird	<i>Butorides virescens</i>	Green Heron							X			G5	S4B							L4
Bird	<i>Larus argentatus</i>	Herring Gull		X				X				G5	S5B, S5N						X	L4
Bird	<i>Eremophila alpestris</i>	Horned Lark	X					X				G5	S5B						X	L3
Bird	<i>Carpodacus mexicanus</i>	House Finch		X			X					G5	SNA						X	L+
Bird	<i>Passer domesticus</i>	House Sparrow		X	X				X			G5	SNA							L+
Bird	<i>Troglodytes aedon</i>	House Wren							X			G5	S5B						X	L5
Bird	<i>Charadrius vociferus</i>	Killdeer		X	X				X			G5	S5B,S5N						X	L4
Bird	<i>Empidonax minimus</i>	Least Flycatcher							X			G5	S4B						X	L4
Bird	<i>Anas platyrhynchos</i>	Mallard		X					X		X	G5	S5						X	L5
Bird	<i>Falco columbarius</i>	Merlin		X								G5	S5B		NAR			P		L3
Bird	<i>Zenaida macroura</i>	Mourning Dove		X	X				X	X	X	G5	S5						X	L5
Bird	<i>Oporornis philadelphia</i>	Mourning Warbler		X			X					G5	S4B						X	L3

Appendix B Wildlife Species List

Type	Scientific Name	Common Name	TRCA Fauna data	Nature Counts eBird	OBBA (2001-2005)	Ontario Nature Reptile Atlas	LGL Data (Visit 1)	LGL Data (Visit 2)	LGL Data (both visits 1 and 2)	LGL Data (Visit 3)	LGL Data (Visit 4)	G-Rank	S-Rank	Schedule	COSEWIC	SARA	SARO	FWCA	MBCA	TRCA
Bird	<i>Cardinalis cardinalis</i>	Northern Cardinal		X	X				X	X		G5	S5						X	L5
Bird	<i>Colaptes auratus</i>	Northern Flicker		X			X					G5	S4B						X	L4
Bird	<i>Mimus polyglottos</i>	Northern Mockingbird	X	X								G5	S4						X	L4
Bird	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	X	X					X			G5	S4B						X	L4
Bird	<i>Seiurus aurocapilla</i>	Ovenbird		X								G5	S4B						X	L2
Bird	<i>Carduelis pinus</i>	Pine Siskin		X								G5	S4B						X	L4
Bird	<i>Vireo olivaceus</i>	Red-eyed Vireo	X	X					X			G5	S5B						X	L4
Bird	<i>Buteo jamaicensis</i>	Red-tailed Hawk		X								G5	S5		NAR			P		L5
Bird	<i>Agelaius phoeniceus</i>	Red-winged Blackbird		X					X	X	X	G5	S4							L5
Bird	<i>Larus delawarensis</i>	Ring-billed Gull		X				X			X	G5	S5B,S4N						X	L4
Bird	<i>Columba livia</i>	Rock Dove (Pigeon)		X					X			G5	SNA							L+
Bird	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak					X					G5	S4B						X	L4
Bird	<i>Grus canadensis tabida</i>	Sandhill Crane		X								G5	S5B		NAR				X	
Bird	<i>Passerculus sandwichensis</i>	Savannah Sparrow	X						X			G5	S4B						X	L4
Bird	<i>Piranga olivacea</i>	Scarlet Tanager					X					G5	S4B						X	L3
Bird	<i>Bubo scandiaca</i>	Snowy Owl		X								G5	SNA					P		
Bird	<i>Melospiza melodia</i>	Song Sparrow		X					X		X	G5	S5B						X	L5
Bird	<i>Actitis macularius</i>	Spotted Sandpiper	X	X					X			G5	S5						X	L4
Bird	<i>Catharus ustulatus</i>	Swainson's Thrush					X					G5	S4B						X	
Bird	<i>Melospiza georgiana</i>	Swamp Sparrow	X				X					G5	S5B						X	L4
Bird	<i>Tachycineta bicolor</i>	Tree Swallow	X						X			G5	S4B						X	L4
Bird	<i>Cathartes aura</i>	Turkey Vulture		X								G5	S5B					P		L4
Bird	<i>Poocetes gramineus</i>	Vesper Sparrow								X		G5	S5B						X	L3
Bird	<i>Vireo gilvus</i>	Warbling Vireo							X	X		G5	S5B						X	L5
Bird	<i>Sitta carolinensis</i>	White-breasted Nuthatch						X				G5	S5						X	L4
Bird	<i>Zonotrichia leucophrys</i>	White-crowned Sparrow		X								G5	S4B						X	
Bird	<i>Empidonax traillii</i>	Willow Flycatcher	X	X					X	X		G5	S5B						X	L4
Bird	<i>Wilsonia pusilla</i>	Wilson's Warbler					X					G5	S4B						X	
Bird	<i>Troglodytes troglodytes</i>	Winter Wren		X								G5	S5B						X	L3
Bird	<i>Aix sponsa</i>	Wood Duck	X									G5	S5						X	L4
Bird	<i>Hylocichla mustelina</i>	Wood Thrush		X								G5	S4B	No Schedule	THR		SC		X	L3
Bird	<i>Dendroica petechia</i>	Yellow Warbler		X					X	X		G5	S5B						X	L5
Invertebrates	<i>Danaus plexippus</i>	Monarch					X					G5	S4B, S2N	Schedule 1	SC		SC	P		
Mammals	<i>Castor canadensis</i>	Beaver							X			G5	S5					F		L4
Mammals	<i>Tamias striatus</i>	Eastern Chipmunk						X				G5	S5					P		L4
Mammals	<i>Sylvilagus floridanus</i>	Eastern Cottontail	X									G5	S5					G		L4
Mammals	<i>Sciurus carolinensis</i>	Eastern Gray Squirrel							X			G5	S5					G		L5
Mammals	<i>Marmota monax</i>	Groundhog	X									G5	S5							L5
Mammals	<i>Ondatra zibethica</i>	Muskrat	X						X			G5	S5					F		L4
Mammals	<i>Procyon lotor</i>	Northern Raccoon							X			G5	S5					F		L5
Mammals	<i>Odocoileus virginianus</i>	White-tailed Deer	X						X			G5	S5					G		L4
Reptile	<i>Storeria dekayi</i>	Dekay's Brown Snake				X						G5	S5		NAR					L4
Reptile	<i>Thamnophis sirtalis</i>	Eastern Gartersnake				X						G5T5	S5							L4
Reptile	<i>Storeria occipitomaculata occipitomaculata</i>	Northern Red-bellied Snake				X						G5T5	S5							L3
Reptile	<i>Chelydra serpentina</i>	Snapping Turtle				X						G5	S3	Schedule 1	SC	SC	SC	G		L2
Reptile	<i>Apalone spinifera</i>	Spiny Softshell										G5	S3	Schedule 1	THR	THR	THR	P		
Reptile	<i>Clemmys guttata</i>	Spotted Turtle										G5	S3	Schedule 1	END	END	END	P		
Reptile	<i>Sternotherus odoratus</i>	Stinkpot (Musk Turtle)										G5	S3	Schedule 1	SC	THR	SC	P		LX
Reptile	<i>Crotalus horridus</i>	Timber Rattlesnake										G4	SX	Schedule 1	EXT	EXT	EXP			
Reptile	<i>Chrysemys picta bellii</i>	Western Painted Turtle (Boreal/Canadian Shield population)										G5T5	S4		NAR			P		
Reptile	<i>Glyptemys insculpta</i>	Wood Turtle										G4	S2	Schedule 1	THR	THR	END	P		

Appendix C Plant List.

Appendix C Plant List

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
	EQUISETACEAE	HORSETAIL FAMILY					
	<i>Equisetum arvense</i>	field horsetail	G5	S5			L5
	PINACEAE	PINE FAMILY					
*	<i>Picea abies</i>	Norway spruce	G?	SE3			L+
	<i>Picea glauca</i>	white spruce	G5	S5			L3
	<i>Pinus banksiana</i>	jack pine	G5	S5			L+
*	<i>Pinus nigra</i>	Austrian pine	G?	SE2			L+
	<i>Pinus strobus</i>	eastern white pine	G5	S5			L4
*	<i>Pinus sylvestris</i>	scotch pine	G?	SE5			L+
	<i>Tsuga canadensis</i>	eastern hemlock	G5	S5			L4
	CUPRESSACEAE	CEDAR FAMILY					
	<i>Juniperus virginiana</i>	eastern red cedar	G5	S5			L5
	<i>Thuja occidentalis</i>	eastern white cedar	G5	S5			L4
	RANUNCULACEAE	BUTTERCUP FAMILY					
	<i>Actaea rubra</i>	red baneberry	G5	S5			L5
	<i>Anemone canadensis</i>	Canada anemone	G5	S5			L5
*	<i>Ranunculus acris</i>	tall buttercup	G5	SE5			L+
	BERBERIDACEAE	BARBERRY FAMILY					
	<i>Podophyllum peltatum</i>	may-apple	G5	S5			L5
	PAPAVERACEAE	POPPY FAMILY					
*	<i>Chelidonium majus</i>	celandine	G?	SE5			L+
	HAMAMELIDACEAE	WITCH-HAZEL FAMILY					
	<i>Hamamelis virginiana</i>	witch-hazel	G5	S5			L3
	ULMACEAE	ELM FAMILY					
	<i>Celtis occidentalis</i>	common hackberry	G5	S4			
	<i>Ulmus americana</i>	white elm	G5?	S5			L5

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
*	<i>Ulmus pumila</i>	Siberian elm	G?	SE3			L+
	<i>Zelkova serrata</i>	Japanese Zelkova					
	URTICACEAE	NETTLE FAMILY					
*	<i>Urtica dioica ssp. dioica</i>	European stinging nettle	G5T?	SE2			L+
	JUGLANDACEAE	WALNUT FAMILY					
	<i>Carya cordiformis</i>	bitternut hickory	G5	S5			L4
	<i>Juglans nigra</i>	black walnut	G5	S4			L5
	FAGACEAE	BEECH FAMILY					
	<i>Fagus grandifolia</i>	American beech	G5	S5			L4
	<i>Quercus alba</i>	white oak	G5	S5			L3
	<i>Quercus macrocarpa</i>	bur oak	G5	S5			L4
	<i>Quercus rubra</i>	red oak	G5	S5			L4
	BETULACEAE	BIRCH FAMILY					
*	<i>Alnus glutinosa</i>	European black alder	G?	SE4			L+
	<i>Betula papyrifera</i>	white birch	G5	S5			L4
*	<i>Betula pendula</i>	European weeping birch	G?	SE4			L+
	<i>Ostrya virginiana</i>	ironwood	G5	S5			L5
	CARYOPHYLLACEAE	PINK FAMILY					
*	<i>Cerastium fontanum</i>	larger mouse-ear chickweed	G?	SE5			L+
*	<i>Stellaria media</i>	common chickweed	G?	SE5			L+
	POLYGONACEAE	SMARTWEED FAMILY					
*	<i>Polygonum cuspidatum</i>	Japanese knotweed	G?	SE4			L+
	<i>Polygonum sp.</i>	smartweed					
*	<i>Rumex crispus</i>	curly-leaf dock	G?	SE5			L+
	GUTTIFERAE	ST. JOHN'S-WORT FAMILY					
*	<i>Hypericum perforatum</i>	common St. John's-wort	G?	SE5			L+
	TILIACEAE	LINDEN FAMILY					
	<i>Tilia americana</i>	basswood	G5	S5			L5

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
*	<i>Tilia cordata</i>	small leaf linden	G?	SE1			L+
	CUCURBITACEAE	GOURD FAMILY					
	<i>Echinocystis lobata</i>	prickly cucumber	G5	S5			L5
	SALICACEAE	WILLOW FAMILY					
*	<i>Populus alba</i>	silver poplar	G5	SE5			L+
	<i>Populus balsamifera ssp. balsamifera</i>	balsam poplar	G5T?	S5			L5
	<i>Populus deltoides</i>	cottonwood	G5T?	S5			L5
	<i>Populus grandidentata</i>	large-tooth aspen	G5	S5			L4
	<i>Populus tremuloides</i>	trembling aspen	G5	S5			L5
*	<i>Salix fragilis</i>	crack willow	G?	SE5			L+
*	<i>Salix X rubens</i>	reddish willow	HYB	SE4			L+
*	<i>Salix X sepulcralis</i>	hybrid willow	HYB	SE2			L+
	BRASSICACEAE	MUSTARD FAMILY					
*	<i>Alliaria petiolata</i>	garlic mustard	G5	SE5			L+
*	<i>Barbarea vulgaris</i>	yellow rocket	G?	SE5			L+
*	<i>Hesperis matronalis</i>	dame's rocket	G4G5	SE5			L+
*	<i>Lepidium campestre</i>	field cress	G?	SE5			L+
*	<i>Sisymbrium altissimum</i>	tall tumble-mustard	G?	SE5			L+
*	<i>Thlaspi arvense</i>	field penny-cress	G?	SE5			L+
	PRIMULACEAE	PRIMROSE FAMILY					
*	<i>Lysimachia nummularia</i>	moneywort	G?	SE5			L+
	ROSACEAE	ROSE FAMILY					
	<i>Agrimonia gryposepala</i>	tall hairy agrimony	G5	S5			L5
	<i>Fragaria virginiana ssp. virginiana</i>	scarlet strawberry					
	<i>Geum aleppicum</i>	yellow avens	G5	S5			L4
	<i>Geum canadense</i>	white avens	G5	S5			L5
*	<i>Potentilla recta</i>	rough-fruited cinquefoil	G?	SE5			L+
	<i>Amelanchier sp.</i>	juneberry					

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
*	<i>Crataegus monogyna</i>	English hawthorn	G5	SE5			L+
	<i>Crataegus punctata</i>	large-fruited thorn	G5	S5			L5
*	<i>Malus baccata</i>	Siberian crabapple	G?	SE1			L+
*	<i>Malus pumila</i>	common apple	G5	SE5			L+
	<i>Physocarpus opulifolius</i>	ninebark	G5	S5			L3
	<i>Prunus serotina</i>	black cherry	G5	S5			L5
	<i>Prunus virginiana ssp. virginiana</i>	choke cherry	G5T?	S5			L5
*	<i>Pyrus communis</i>	common pear	G5	SE4			L+
*	<i>Rosa multiflora</i>	multiflora rose	G?	SE4			L+
*	<i>Rosa rubiginosa</i>	sweetbrier rose		SE4			L+
	<i>Rubus idaeus ssp. melanolasius</i>	wild red raspberry	G5T	S5			L5
	<i>Rubus occidentalis</i>	thimble-berry	G5	S5			L5
	FABACEAE	PEA FAMILY					
*	<i>Coronilla varia</i>	variable crown-vetch	G?	SE5			L+
*	<i>Lotus corniculatus</i>	bird's-foot trefoil	G?	SE5			L+
*	<i>Medicago lupulina</i>	black medick	G?	SE5			L+
*	<i>Melilotus alba</i>	white sweet-clover	G?	SE5			L+
*	<i>Vicia cracca</i>	tufted vetch	G?	SE5			L+
*	<i>Robinia pseudo-acacia</i>	black locust	G5	SE5			L+
	ELAEAGNACEAE	OLEASTER FAMILY					
*	<i>Elaeagnus angustifolia</i>	Russian olive	G?	SE3			L+
	LYTHRACEAE	LOOSESTRIFE FAMILY					
*	<i>Lythrum salicaria</i>	purple loosestrife	G5	SE5			L+
	ONAGRACEAE	EVENING-PRIMROSE FAMILY					
	<i>Circaea lutetiana ssp. canadensis</i>	yellowish enchanter's nightshade	G5T5	S5			L5
	<i>Oenothera biennis</i>	common evening-primrose	G5	S5			L5
	CORNACEAE	DOGWOOD FAMILY					

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
	<i>Cornus alternifolia</i>	alternate-leaved dogwood	G5	S5			L5
	<i>Cornus foemina ssp. racemosa</i>	red panicked dogwood	G5?	S5			L5
	<i>Cornus stolonifera</i>	red-osier dogwood	G5	S5			L5
	CELASTRACEAE	STAFF-TREE FAMILY					
*	<i>Euonymus europaea</i>	spindle tree	G?	SE2			L+
	AQUIFOLIACEAE	HOLLY FAMILY					
	<i>Ilex verticillata</i>	winterberry	G5	S5			L3
	EUPHORBIACEAE	SPURGE FAMILY					
*	<i>Euphorbia esula</i>	leafy spurge	G5	SE5			L+
	RHAMNACEAE	BUCKTHORN FAMILY					
*	<i>Rhamnus cathartica</i>	common buckthorn	G?	SE5			L+
	VITACEAE	GRAPE FAMILY					
	<i>Parthenocissus quinquefolia</i>	five-leaved Virginia-creeper	G5	S4?			L5
	<i>Vitis riparia</i>	riverbank grape	G5	S5			L5
	ACERACEAE	MAPLE FAMILY					
*	<i>Acer ginnala</i>	amur maple	G?	SE1			L+
	<i>Acer negundo</i>	Manitoba maple	G5	S5			L+?
*	<i>Acer platanooides</i>	Norway maple	G?	SE5			L+
	<i>Acer rubrum</i>	red maple	G5	S5			L4
	<i>Acer saccharum ssp. saccharum</i>	sugar maple	G5T?	S5			L5
	<i>Acer saccharinum</i>	silver maple	G5	S5			L4
	ANACARDIACEAE	SUMAC FAMILY					
	<i>Rhus rydbergii</i>	western poison-ivy	G5T	S5			L5
	<i>Rhus typhina</i>	staghorn sumac	G5	S5			L5
	GERANIACEAE	GERANIUM FAMILY					
*	<i>Geranium robertianum</i>	herb-robert	G5	SE5			L+?
	BALSAMINACEAE	TOUCH-ME-NOT FAMILY					
	<i>Impatiens capensis</i>	spotted touch-me-not	G5	S5			L5

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
*	<i>Impatiens glandulifera</i>	glandular touch-me-not	G?	SE4			L+
	APIACEAE	PARSLEY FAMILY					
*	<i>Aegopodium podagraria</i>	goutweed	G?	SE5			L+
*	<i>Daucus carota</i>	wild carrot	G?	SE5			L+
	<i>Osmorhiza claytonii</i>	woolly sweet-cicely	G5	S5			L4
	ASCLEPIADACEAE	MILKWEED FAMILY					
	<i>Asclepias syriaca</i>	common milkweed	G5	S5			L5
*	<i>Cynanchum rossicum</i>	swallow-wort	G?	SE5			L+
	SOLANACEAE	POTATO FAMILY					
*	<i>Solanum dulcamara</i>	bitter nightshade	G?	SE5			L+
	CONVOLVULACEAE	MORNING-GLORY FAMILY					
*	<i>Convolvulus arvensis</i>	field bindweed	G?	SE5			L+
	BORAGINACEAE	BORAGE FAMILY					
	<i>Myosotis laxa</i>	smaller forget-me-not	G5	S5			L4
	LAMIACEAE	MINT FAMILY					
	<i>Clinopodium vulgare</i>	wild basil	G?	S5			L5
*	<i>Glechoma hederacea</i>	creeping Charlie	G?	SE5			L+
*	<i>Leonurus cardiaca</i> ssp. <i>cardiaca</i>	common motherwort	G?T?	SE5			L+
	PLANTAGINACEAE	PLANTAIN FAMILY					
*	<i>Plantago lanceolata</i>	ribgrass	G5	SE5			L+
*	<i>Plantago major</i>	common plantain	G5	SE5			L+
	OLEACEAE	OLIVE FAMILY					
	<i>Fraxinus americana</i>	white ash	G5	S5			L5
	<i>Fraxinus pennsylvanica</i>	red ash	G5	S5			L5
*	<i>Ligustrum vulgare</i>	common privet	G?	SE5			L+
*	<i>Syringa vulgaris</i>	common lilac	G?	SE5			L+
	SCROPHULARIACEAE	FIGWORT FAMILY					
*	<i>Linaria vulgaris</i>	butter-and-eggs	G?	SE5			L+

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
*	<i>Verbascum blattaria</i>	moth mullein	G?	SE5			L+
*	<i>Verbascum thapsus</i>	common mullein	G?	SE5			L+
	CAPRIFOLIACEAE	HONEYSUCKLE FAMILY					
*	<i>Lonicera tatarica</i>	tartarian honeysuckle	G?	SE5			L+
	<i>Sambucus canadensis</i>	common elderberry	G5	S5			L5
	<i>Viburnum cassinoides</i>	northern wild raisin	G5	S5			L2
	<i>Viburnum lentago</i>	nannyberry	G5	S5			L5
*	<i>Viburnum opulus</i>	guelder rose	G5	SE4			L+
*	<i>Weigela florida</i>	Weigela					
	DIPSACACEAE	TEASEL FAMILY					
*	<i>Dipsacus fullonum ssp. sylvestris</i>	wild teasel	G?T?	SE5			L+
	ASTERACEAE	ASTER FAMILY					
*	<i>Achillea millefolium ssp. millefolium</i>	common yarrow	G5T?	SE?			L+
	<i>Ambrosia artemisiifolia</i>	common ragweed	G5	S5			L5
	<i>Ambrosia trifida</i>	giant ragweed	G5	S5			L5
*	<i>Anthemis arvensis</i>	corn chamomille	G?	SE5			L+
*	<i>Arctium minus ssp. minus</i>	common burdock	G?T?	SE5			L+
*	<i>Artemisia biennis</i>	biennial wormwood	G5	SE5			L+
	<i>Aster cordifolius</i>	heart-leaved aster	G5	S5			L5
	<i>Aster lanceolatus ssp. lanceolatus</i>	tall white aster	G5T?	S5			L5
	<i>Aster novae-angliae</i>	New England aster	G5	S5			L5
	<i>Aster puniceus var. puniceus</i>	swamp aster	G5T?Q	SU			L5
	<i>Bidens frondosa</i>	devil's beggar-ticks	G5	S5			L5
*	<i>Cichorium intybus</i>	chicory	G?	SE5			L+
*	<i>Cirsium arvense</i>	Canada thistle	G?	SE5			L+
*	<i>Cirsium vulgare</i>	bull thistle	G5	SE5			L+
	<i>Erigeron annuus</i>	daisy fleabane	G5	S5			L5

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
	<i>Erigeron philadelphicus ssp. philadelphicus</i>	Philadelphia fleabane	G5T?	S5			L5
	<i>Eupatorium maculatum ssp. maculatum</i>	spotted joe-pye-weed	G5T5	S5			L5
	<i>Eupatorium rugosum</i>	white snakeroot	G5	S5			L5
*	<i>Helianthus tuberosus</i>	Jerusalem artichoke	G5	SE5			L5
	<i>Hieracium sp.</i>	hawkweed					
*	<i>Inula helenium</i>	elecampane	G?	SE5			L+
*	<i>Matricaria matricarioides</i>	pineapple-weed	G5	SE5			L+
	<i>Solidago canadensis</i>	canada goldenrod	G5	S5			L5
	<i>Solidago flexicaulis</i>	zig-zag goldenrod	G5	S5			L5
*	<i>Sonchus arvensis ssp. arvensis</i>	field sow-thistle	G?T?	SE5			L+
*	<i>Tanacetum vulgare</i>	common tansy	G?	SE5			L+
*	<i>Taraxacum officinale</i>	common dandelion	G5	SE5			L+
*	<i>Tussilago farfara</i>	coltsfoot	G?	SE5			L+
	<i>Xanthium strumarium</i>	tumor-curing cocklebur	G?	S5			L5
	POACEAE	GRASS FAMILY					
*	<i>Bromus inermis ssp. inermis</i>	awnless brome	G4G5T?	SE5			L+
*	<i>Dactylis glomerata</i>	orchard grass	G?	SE5			L+
	<i>Panicum virgatum</i>	switch grass	G5	S4			L3
	<i>Phalaris arundinacea</i>	reed canary grass	G5	S5			L+?
*	<i>Phleum pratense</i>	timothy	G?	SE5			L+
	<i>Phragmites australis</i>	common reed	G5	S5			L+?
	<i>Poa compressa</i>	Canada blue grass	G?	S5			L+
	<i>Poa pratensis ssp. pratensis</i>	Kentucky bluegrass	G5T	S5			L+
*	<i>Setaria viridis</i>	green foxtail	G?	SE5			L+
	TYPHACEAE	CATTAIL FAMILY					
	<i>Typha angustifolia</i>	narrow-leaved cattail	G5	S5			L+
	LILIACEAE	LILY FAMILY					

	Scientific Name	Common Name	GRank	SRank	MNR	COSEWIC	Local Status
	<i>Allium tricoccum</i>	wild leek	G5	S5			L4
	<i>Erythronium americanum ssp. americanum</i>	yellow dog's-tooth violet	G5T5	S5			L5
	IRIDACEAE	IRIS FAMILY					
	<i>Iris versicolor</i>	multi-coloured blue-flag	G5	S5			L3

***introduced**