APPENDIX D
Natural Heritage Study

DRAFT

Matrix Solutions Inc.
A Montrose Environmental Company

Dixie-Dundas Flood Mitigation
Natural Heritage Study

Prepared for:

City of Mississauga

Prepared by:

Matrix Solutions Inc., a Montrose Environmental Company

Version 1.3

March 2024

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Dixie-Dundas Flood Mitigation

Natural Heritage Study

Prepared for City of Mississauga, March 2024

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VERSION CONTROL

Version	Date	Issue Type	Filename	Description
V0.1	19-Mar-2020	Draft	24604-531 R NHS 2020-03-19 draft V0.1.docx	Issued to client for review
V1.0	08-Jul-2020	Final	24604-531 R NHS 2020-07-08 final V1.0.docx	Issued to client
V1.1	30-Nov-2021	Draft revised	24604-531 R NHS 2020-11-30 draft V1.1.docx	Report updated to incorporate study area south of Dundas Street; revisions issued to client for review
V1.2	21-Nov-2023	Draft revised 1	24604-531 R NHS 2023-11-21 draft V1.2.docx	Updates included from client; reissued for review
V1.3	15-Mar-2024	Draft revised 2	24604-531 R NHS 2024-03-15 draft V1.3.docx	Addressed agency comments. Updated with preferred alternatives.

Table of Contents

In-text Figures

In-text Tables

Appendices

1 Introduction

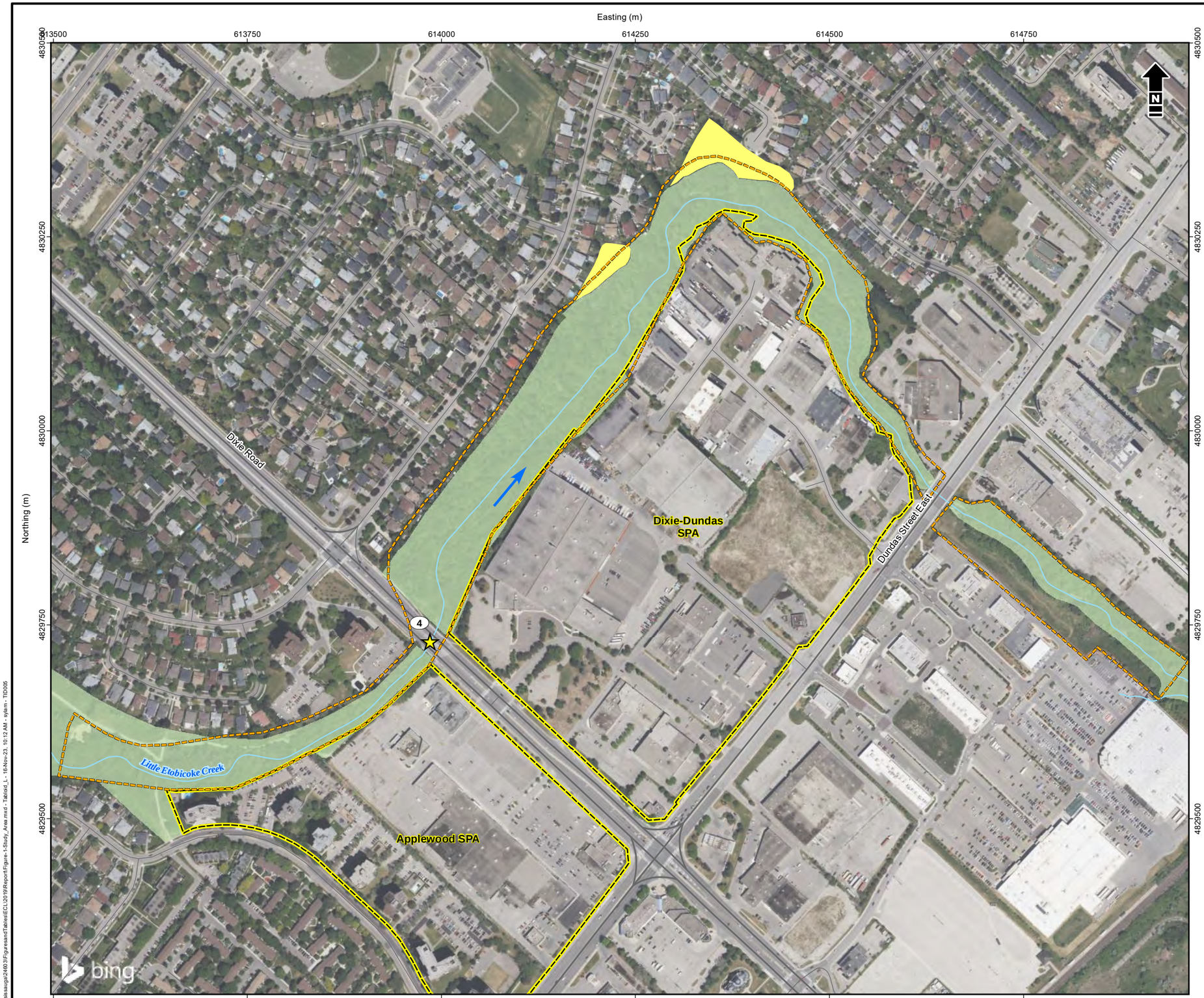
Matrix Solutions Inc. was retained by the City of Mississauga (the City) to create a feasibility study for flood mitigation measures in Little Etobicoke Creek. Little Etobicoke Creek is an urban creek system which has been highly impacted by flood flows in recent years. Under regulatory flow conditions, approximately 130 m^3/s of flood water spills beyond the floodplain of Little Etobicoke Creek at Queen Frederica Drive. And as a result, over 1,000 residential and commercial buildings between the Queen Frederica Drive and the Queen Elizabeth Way (QEW) are at risk of flood damage.

The City's objective for the flood mitigation feasibility study is to modify the natural and built infrastructure of Little Etobicoke Creek, such that flood flows are contained within the floodplain upstream of Dixie Road, thereby removing the spill that flows toward the Applewood Creek watershed during large rainfall events. To assist the project through the various phrases of the Municipal Class Environmental Assessment process, various technical studies were completed. This Natural Heritage Study (NHS) Report is one of those technical studies and has identified the existing conditions of the natural heritage features within the study area. The NHS report consists of data collected during background reviews and field studies, as well as an assessment of the environmental impacts of the alternative solutions.

1.1 Study Area

The study area is located within Little Etobicoke Creek between the area 500 m west of Dixie Road and approximately 360 m east of Dundas Street East within the City (Figure 1). Originally, the project study area encompassed only the area approximately 500 m west of Dixie Road and 200 m east of Dixie Road; however, two study area extensions have occurred. First, in the summer of 2019 the study area was extended to include the entire area of Little Etobicoke Creek all the way to Dundas Street East. The second extension occurred in 2021 with the addition of the 360 m of creek east of Dundas Street East.

Little Etobicoke Creek is part of the Etobicoke Creek watershed which is regulated by the Toronto and Region Conservation Authority (TRCA) and is also part of the City's "Significant Natural Areas and Natural Green Spaces." The large meander bend at the northeast corner of the site, approximately 500 m upstream of Dundas Street East, is considered a "Special Management Area" within the City (Figure 1). "Special Management Areas are lands adjacent to or near Significant Natural Areas or Natural Green Spaces and will be managed or restored to enhance and support the Significant Natural Area or Natural Green Space" (City of Mississauga 2021). Within the study area, Little Etobicoke Creek is surrounded by a small, predominantly deciduous, riparian community as well as residential and commercial buildings.



- Natural Heritage Study Area
- Special Policy Area
- Special Management Areas
- Significant Natural Areas and Natural Green Spaces
- Watercourse
- Flow Direction
- Highway
- Road
- Dixie Road Bridge

Reference: Contains information licensed under the Open Government Licence – Ontario. Contains data obtained by Matrix Solutions Inc. and the City of Mississauga. Imagery: Service Layer Credits: © 2023 Microsoft Corporation © 2023 Maxar ©CNES (2023) Distribution Airbus DS

1:5,000 metres
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NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
A Montrose Environmental Company

City of Mississauga
Dixie-Dundas Flood Mitigation

Natural Heritage Study Area

Date:	Project:	Submitter:	Reviewer:
November 2023	24603	E. Wilkinson	R. Leppington

Figure 1

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2 Regulatory Framework

Review of the regulatory framework provides guidance on the protection of natural heritage features and evaluation of significance. Natural heritage features identified within the study area were evaluated against the federal, provincial, and municipal planning policies applicable to the study area (Table 1Table).

Table 1 Applicable Federal, Provincial, and Municipal Policies

Legislation	Policies and Regulations	Guidelines	Summary of Contents
Federal Acts and Regulations			
Species at Risk Act (SARA; 2002)	N/A	N/A	• SARA incorporates a number of prohibitions to protect SAR, providing recovery strategies for extirpated, endangered, or threatened species, as well as managing species of special concern (Government of Canada, 2016). • On private or provincially-owned lands, only aquatic species listed as endangered, threatened, or extirpated and migratory birds listed on Schedule 1 are protected under SARA, unless ordered by the Governor in Council, or for those species that have critical habitat identified. Schedule 1 migratory birds where critical habitat has been identified require consideration under SARA. Should a species also be listed under SARA and the ESA, where the ESA provides equal or greater protection, the ESA takes precedence. • **Applicability to Project:** Should any SAR fish, mussel, or migratory bird species be identified within the study area, protections under SARA will come into effect.

Legislation	Policies and Regulations	Guidelines	Summary of Contents
Fisheries Act (1985, amended 2019)	Fish Protection Policy Statement (2013)	N/A	• The *Fisheries Act* outlines the framework for the management and regulation of fisheries and the conservation and protection of fish and fish habitat within the fishing zones of Canada, all waters in the territorial sea of Canada, and all internal waters of Canada. • The most recent revision (2019) restores protections to both fish and fish habitat by prohibiting the harmful alteration, disruption, or destruction (HADD) of fish habitat and prohibiting the death of fish. Environmental recommendations and mitigation measures are to include the provision of timing windows, to avoid the death of fish or the HADD of fish habitat. Any proposed works that may result in either require a Request for Review submitted to the DFO. • **Applicability to Project:** Any activities that may impact Little Etobicoke Creek or other watercourses within the study area could require a Request for Review from the DFO. In-water work is not permitted within the watercourse during the fisheries timing window for warmwater fish from April 1 to June 30.
Migratory Birds Convention Act (MBCA; 1994, amended on 2017)	Migratory Birds Regulation (2022) Migratory Bird Sanctuary Regulations (2022)	N/A	• The MBCA affords protection to birds listed under Article 1 of the MBCA. General prohibitions protect migratory birds, their nests, and their eggs, and prohibits the deposition of harmful substances in waters and other areas frequented by them. • The MBR clarifies the nest protection timelines for 18 species that are listed on Schedule 1. These timelines include a waiting period until the nest can be deemed abandoned and subsequently removed. The waiting period for these 18 species remains in effect even if the nest is unoccupied. Nest protection for all other species which are not listed in Article 1 remains the same, with nest removal occurring once the young have fledged. • **Applicability to Project:** All vegetation removal shall occur outside of the migratory bird nesting window of April 1 to August 31 of any year to avoid disturbing active nests.

Legislation	Policies and Regulations	Guidelines	Summary of Contents
Provincial Acts and Regulations			
Places to Grow Act (2005)	*A Place to Grow. Growth Plan for the Greater Golden Horseshoe* (2020) O. Reg. 416/05: Growth Plan Areas	N/A	• The *Places to Grow Act* enables the development of regional growth plans that guide government investments and land use planning policies. • The Growth Plan for the Greater Golden Horseshoe provides a framework for long-term management of growth within the region. It builds upon the policies in the PPS 2020 provides direction on how and where the region will grow. • **Applicability to Project:** The Region of Peel has been designated as a Growth Plan Area. The project area is subject to policies under the Growth Plan for the Greater Golden Horseshoe (2020).
Endangered Species Act (ESA; 2007, amended 2020)	O. Reg.'s: 230/08 242/08 829/21 830/21 832/21	N/A	• The ESA provides conservation and protection of species in Ontario. Species listed as endangered or threatened under the ESA are afforded legal protection from harm and harassment. The ESA also prohibits damage or destruction of habitat of endangered or threatened species. Habitat protection for a species can be general or subject to the specific provisions of a habitat regulation as set out in O. Reg. 832/21. • **Applicability to Project:** The ESA applies to all SAR within provincial lands protected under the ESA. Any impacts to these species or their habitats protected under the ESA would require a permit. There is a confirmed Butternut within the study area and there is potential for other SAR to occur within it as well.

Legislation	Policies and Regulations	Guidelines	Summary of Contents
Fish and Wildlife Conservation Act (1997, amended 2021)	O. Reg.'s: 663/98 664/98 665/98 666/98 667/98 668/98 669/98 670/98	N/A	• The *Fish and Wildlife Conservation Act* affords protection for some species of birds, amphibians, reptiles, and mammals in Ontario. • Some bird species which are not afforded protection under the MBCA are afforded protection under the *Fish and Wildlife Conservation Act*. • **Applicability to Project:** There may be suitable habitat along Little Etobicoke Creek, and within the study area for some of these species, such as raptors or fur bearing mammals. Environmental management considerations should include timing windows for vegetation clearing and for construction.

Legislation	Policies and Regulations	Guidelines	Summary of Contents
Conservation Authorities Act (1990, amended 2022)	O. Reg. 166/06: Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. The Living City Policies for Planning and Development in the Watersheds of the Toronto and Region Conservation Authority (TRCA, 2014)	Planning & Development Procedural Manual (TRCA, 2008) TRCA Environmental Impact Statement Guidelines (2014) Guideline for Determining Ecosystem Compensation (TRCA, 2018) Erosion and Sediment Control Guide for Urban Construction (TRCA, 2019)	• The *Conservation Authorities Act* empowers conservation authorities to regulate activities in natural and hazardous areas (such as streams, floodplains, wetlands, areas in and near rivers, slopes, and lake shoreline) through the Development, Interference with Wetlands, and Alterations to Shorelines and Watercourse Regulation. **Applicability to Project:** • A portion of the study area is located within the jurisdiction of the TRCA (regulated under O. Reg. 166/06). Any works within the regulatory limit may require a permit under section 28 of the Conservation Authorities (CA) Act. • A portion of the project is located within two Special Policy Areas and is subject to additional provincial regulations. **Additional Guidelines:** • Crossing Guidelines for Valley and Stream Corridors (TRCA, 2015) • Forest Edge Management Plan Guidelines (TRCA, 2004) • Seed Mix Guideline V.2.0 (TRCA, 2022) • Flora Species Native to the TRCA Jurisdiction (TRCA, 2022) • Preserving and Restoring Healthy Soil: Best Practices for Urban Construction (TRCA, 2012)
Municipal Acts and Regulations			
Region of Peel Official Plan (2022)	N/A	N/A	• The Greenlands System identifies Core Natural Heritage features and linkages within the landscape. These include wetlands, woodlands, valleylands, stream corridors, shorelines and lakes, ANSIs, significant wildlife habitat and other natural or protected areas. • **Applicability to Project:** The project area contains core areas as part of the Greenlands System. These lands are subject to the natural heritage policies as outlined in the Region of Peel Official Plan.

Legislation	Policies and Regulations	Guidelines	Summary of Contents
City of Mississauga Official Plan (July 2023 Consolidation)	N/A	N/A	• Mississauga's Green System is comprised of the natural heritage system, urban forest, natural hazard lands, and parks and open spaces. The City is committed to protecting, enhancing, restoring, and expanding its Green System. • **Applicability to Project:** The study area is part of the Green System, and is mapped as a Natural Hazard, Special Policy Area Floodplain, Special Management Area, and Significant Natural Area and Natural Green Space.

Notes:
ANSI - Area of Natural and Scientific Interest
DFO - Fisheries and Oceans Canada
ESA - *Endangered Species Act*
GRCA - Grand River Conservation Authority
HADD - harmful alteration, destruction, and displacement
MBCA - *Migratory Birds Convention Act*
MBR - Migratory Birds Regulation
NHRM - *Natural Heritage Reference Manual*
O. Reg. - Ontario Regulation
PPS - Provincial Policy Statement
SAR - species at risk
SARA - *Species at Risk Act*

3 Background Review

3.1 Methods

The following information sources were reviewed for records related to natural heritage features that have the potential or are known to occur within the study area.

3.1.1 Agency Correspondence

Initial information requests regarding terrestrial sensitivities and species at risk (SAR) were submitted to the Ministry of Environment, Conservation and Parks (MECP), and to the TRCA. A background request for natural heritage information was submitted to the TRCA on June 18, 2019. Information was received on June 15, 2019, and was incorporated into Appendix A. A project screening request was sent to the MECP on May 15, 2019, for information related to natural heritage features and species at risk (SAR) potential within the study area. The MECP responded on May 15, 2019, indicating that there was no additional information to be provided. An updated screening request was sent to MECP on April 13, 2021, to include the portion of study area downstream of Dundas Street East. The MECP responded on April 22, 2021, and provided a list of 11 SAR potentially within the study area.

3.1.2 Background Sources

In addition to information provided by these regulatory agencies, other publicly available data sources were reviewed to determine potential Species of Conservation Concern (SCC) and SAR whose occurrence ranges overlap with the study area. Background review material for the study area has also been obtained from available secondary source reports. The majority of background information was provided by the TRCA. Table 2Table summarizes the complete list of background information reviewed for the study area.

Table 2 Background Sources

Source	Citation	Information Reviewed
Land Information Ontario (LIO)	MNR 2000	Natural heritage features data layers
Ontario GeoHub	MNRF 2024a	Natural heritage features data layers
Aquatic Species at Risk Map	DFO 2024	Aquatic species at risk map
Natural Heritage Information Centre (NHIC)	MNRF 2024b	Data records for the study area
Ontario Breeding Bird Atlas (OBBA)	Birds Canada et al. 2024	Species records for the study area
Ontario Butterfly Atlas	TEA 2024a	Species records for the study area
Ontario Moth Atlas	TEA 2024b	Species records for the study area
Ontario Reptile and Amphibian Atlas	Ontario Nature 2024	Species records for the study area
Important Bird Areas	Bird Studies Canada 2024	Data records for the study area

Source	Citation	Information Reviewed
eBird	Cornell Lab of Ornithology 2024	Species records for the study area
iNaturalist	CAS 2024a	Species records for the study area
Ontario Mammals, iNaturalist	CAS 2024b	Species records for the study area
Etobicoke and Mimico Creeks Watersheds Technical Report	TRCA 2010	Species records and natural heritage features for the study area
Etobicoke Creek Watershed Report Card	TRCA 2018	Overall health of watershed
Etobicoke Creek - The Aquatic Ecosystem	TRCA 2006	Species records and natural heritage features for the study area
Natural Areas Survey (NAS)	City of Mississauga 2020	Natural areas across the city

3.2 Analysis of Significance and Sensitivity

The ecological features identified within the study area were evaluated to determine the significance of each feature. Significance is based on regional, provincial, and federal designations, which are described in the following subsections.

3.2.1 Natural Area Designations

Natural area designations are those that are recognized as significant on official plans or in other policy planning documents. This includes Areas of Natural or Scientific Interest (ANSIs; provincially, regionally, or other), significant wetlands (provincially, regionally, or locally), significant woodlands, and Environmentally Significant Areas. ANSIs and Environmentally Significant Areas are evaluated by the province or municipality. Only wetlands and woodlands can be assessed for significance by non-government organizations.

3.2.2 Species at Risk Screening

The background review identified potential SAR that could occur within the study area. All SAR identified were screened to determine the likelihood of occurrence and whether suitable habitat is present.

SAR are defined in this report to include the following provincial and federal designations:

- ESA (provincial; Government of Ontario 2021a): all provincially designated species that are listed as Extirpated, Endangered, or Threatened on the SARO List and protected under the ESA; species listed as Special Concern are considered a SCC, as they are not protected under the ESA.

- SARA (federal; Government of Canada 2021): only applies to fish and migratory birds protected under the Migratory Birds Convention Act, 1994 (MBCA; Government of Canada 2017), anywhere they occur (e.g., includes non-federal land), that are designated as Extirpated, Endangered, and/or Threatened under the SARA. All other species are only protected if special provisions or executive orders are made.

To determine if suitable habitat for SAR is available within the study area, the preferred habitat requirements for reported SAR were compared to vegetation communities, aquatic habitats, and niche habitats identified during field inventories and the background review. The results of the SAR habitat screening are provided in Section 6.5.

4 Field Methodology

Field inventories were completed within the study area by Matrix staff during the spring and summer of 2019 as part of the NHS. Additional field studies were completed in the spring of 2020 to capture spring botanicals within the extended study area up to Dundas Street East. Additional field studies were completed in the spring, summer, and fall of 2021 to obtain data on the extended study area east of Dundas Street East. The names of staff members and the field inventories that they completed are provided in Table 3Table.

Table 3 Field Survey Summary

Field Inventory	Date	Matrix Staff
Vegetation (Ecological Land Classification, Botanical Inventory, Invasive Species)	Spring May 24, 2019 Summer July 10, 2019 Summer August 22, 2019 Fall September 25, 2019 Spring April 8, 2020 Spring April 16, 2021 Summer July 30, 2021 Fall September 24, 2021	K. Reis K. Reis and B. MacVeigh K. Reis and E. Wilkinson E. Wilkinson E. Wilkinson E. Wilkinson E. Wilkinson E. Wilkinson
Fish and Fish Habitat	July 10, 2019 August 22, 2019 July 30, 2021	K. Reis and B. MacVeigh K. Reis and E. Wilkinson R. Leppington and K. Reich
Bat Maternity Roosting Habitat Survey	April 8, 2020 (Leaf-off) June 16, 2020 (Leaf-on) April 16, 2021 (Leaf-off) July 30, 2021 (Leaf-on)	K. Reis and E. Wilkinson E. Wilkinson E. Wilkinson E. Wilkinson
Incidental Observations	May 24, 2019 July 10, 2019 August 22, 2019 September 25, 2019 April 16, 2021 July 20, 2021 September 24, 2021	K. Reis K. Reis and B. MacVeigh K. Reis and E. Wilkinson K. Reis and E. Wilkinson E. Wilkinson E. Wilkinson, K. Reich and R. Leppington E. Wilkinson and K. Reis

4.1.1 Ecological Land Classification

Vegetation community delineation was completed within the study area using aerial photography and refined thorough investigations in the field. The standard Ecological Land Classification (ELC) system for southern Ontario (Lee 2008; Lee et al. 1998) as well as the TRCA Ecological Land Classification Codes and Common Names (TRCA 2019a) were applied. Details of the vegetation communities that were recorded included species composition and dominance, community structure, uncommon species or features, and evidence of anthropogenic disturbance. Vegetation community status rarity was assessed through NHIC vegetation community rankings (MNRF 2019) and the local rarity rankings in the Annual Local Occurrence Score and Local Rank Update (TRCA 2017).

4.1.2 Botanical Inventories

A botanical inventory was completed during the field inventories for each of the vegetation communities. The field investigations were completed during spring, summer, and fall (Table 3Table). A list of species was compiled to determine the presence of SCC, SAR, and invasive species. Habitats of SCC, SAR, and invasive species identified during the field inventories were mapped for the ELC community in which they encompassed.

Plants were identified to family, genus, species, subspecies, and hybrid level according to the Newmaster (1998) Ontario Plant List and cross-referenced with the Database of Vascular Plants of Canada (VASCAN; Brouillet et al. 2020) for scientifically accepted nomenclature.

4.1.3 Bat Maternity Roosting Survey

The location of suitable bat maternity roosting habitat, including snags, was identified following the modified methodology of the Guelph District Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis, and Tri-coloured Bat (MNRF 2017) and Bats and Bat Habitat: Guidelines for Wind Power Projects (MNR 2011). This scoped assessment will provide the likelihood that appropriate habitat for SAR bats is present, however it will not confirm the presence or absence of any bat species.

Phase 1 Bat Habitat Suitability Assessment consists of evaluating the study area and deciding whether any area would be designated as a coniferous, deciduous, or mixed wooded ELC ecosite. Based on aerial photography the study area is dominated by deciduous trees and is adjacent to a large watercourse, these two factors provide a potential suitable habitat for bat maternity roosts. Phase 2 was therefore initiated and was divided into a leaf-off and a leaf-on assessment. Identifying suitable roost trees for Little Brown Myotis and Northern Myotis includes recording the location of all snags that exhibit appropriate attributes including cavities, loose bark, cracks, or knot holes. Identifying suitable roost trees for Tri-Coloured Bats includes recording the location of any Oak trees greater than 10 cm diameter at breast height (DBH), Maple trees greater than 10 cm DBH if the tree includes dead/dying leaf clusters, and any Maple tree greater than 25 cm DBH. Dates of the field inventories are provided in Table 3Table.

4.1.4 Incidental Wildlife

All wildlife observations were documented on all field visits. This included actual direct observations (including vocalizations) of individuals as well as signs of wildlife presence (i.e., tracks, scats, dens, nests, etc.).

4.1.5 Species at Risk Assessment

A habitat screening was conducted to determine the potential occurrence of SAR within the study area. For this screening, SAR are defined as species that are listed as either THR or END under the ESA. Individuals of these species, as well as their habitat, are protected in Ontario. Species listed as SC under the ESA receive protection under the NHRM and their habitat is considered SWH. Species listed under SARA are only protected on federal land or as part of projects that are otherwise being permitted by a federal agency. This includes aquatic SAR.

Matrix conducted a background records review to create a list of potential SAR species within the study area. This list was developed using publicly available resources and community-based ecological monitoring databases. Once the list was compiled, a screening exercise was completed to determine the presence of suitable habitat for each SAR identified as potentially occurring within the subject lands, based on known preferred habitat characteristics for each species. The following species were included within the SAR Screening:

- Species listed as either Threatened (THR) or Endangered (END) under the Endangered Species Act (ESA) administered by the MECP. Individuals of these species, as well as their habitat, are protected in Ontario.

- Species of Conservation Concern (SCC) include those listed as SC under ESA, or species listed as threatened or endangered under the federal Species at Risk Act (SARA), not protected under the ESA, and species with Provincial S-rank assigned by the NHIC as S1 (critically imperiled), S2 (imperiled) or S3 (vulnerable). SCC receive protection under the Natural Heritage Reference Manual, and their habitat is considered significant wildlife habitat (SWH).

- Species listed under SARA are only protected on federal land, as part of projects that are otherwise being permitted by a federal agency and includes aquatic SAR. SARA also requires consideration for any migratory bird listed on Schedule 1 where critical habitat has been identified; however, should the species also be listed under ESA and provides equal or greater protection, the ESA take precedence.

The following probability rankings were used to assess potential habitat within the study area:

- **Low Probability**: The site lacks the necessary size, geographic location, or other features required for SAR habitat.

- **Moderate Probability**: The site contains candidate habitat features, as identified during the site visit and through aerial photography interpretation. Species records identified the species within 10 km of the study area.

- **Confirmed**: The site contains candidate habitat features, as identified during the site visit and through aerial photography interpretation and the SAR was observed onsite by field staff.

4.1.6 Fish Habitat Assessment

A qualitative assessment of the habitat potential based on a modified Ontario Stream Assessment Protocol (OSAP; Stanfield 2017) was conducted in Little Etobicoke Creek within the study area.
The objective of this assessment was to characterize the local aquatic habitat and assign a qualitative habitat potential ranking. Characteristics of high-quality aquatic habitat include natural sinuosity with a well-defined riffle/pool sequence, variability in water depth and bed substrate, naturally occurring woody debris, undercut banks, and natural riparian vegetation overhanging the banks that provides food for various aquatic organisms. The greater the quantity of preferred habitat features present, the higher potential aquatic habitat ranking. The creek was inventoried throughout the reach for a variety of geomorphic features (i.e., riffles, pools, and runs). The modified qualitative OSAP approach included documentation and assessment of the following watercourse conditions:

- general watercourse characteristics (i.e., stream pattern, general gradient, and flow)

- channel characteristics (i.e., wetted width and depth, bankfull width and depth, and depth of riffles/pools/run)

- substrate and bank materials

- other pertinent habitat features (i.e., spawning, nursery, and refuge areas, barriers to fish movement, and macrophyte growth)

- disturbances and evidence of past habitat alterations (i.e., channelization, channel hardening or straightening)

After the completion of the aquatic habitat assessment, field data were summarized to determine the overall habitat potential.

4.1.7 Fish Community Assessment

Fish community sampling was conducted at five sampling stations (Figure 2). Prior to sampling, a Licence to Collect Fish for Scientific Purposes was obtained from the Aurora District MNRF on June 3, 2019, and was amended on June 9, 2019, to include the study area up to Dundas Street East. A follow up licence was obtained on April 23, 2021, to complete fish community sampling in the study area east of Dundas Street East. Following the OSAP Section 3 Module 1 (Stanfield 2017), a single-pass backpack electrofishing survey was conducted, sampling all available habitat within the sampling station. As per OSAP, sampling stations were a minimum of 40 m in length and contained at least one riffle/pool sequence. The amount of effort expended at each sampling station was dependent on the total area of the station.

After fish were captured, fish were transferred to holding bins and processed. All fish with well-defined identification markings or morphometric characteristics were enumerated (i.e., identified, measured and weighed) and released back to the creek. Electrofisher shocker seconds and shock times were also recorded.

Easting (m)

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Northing (m)

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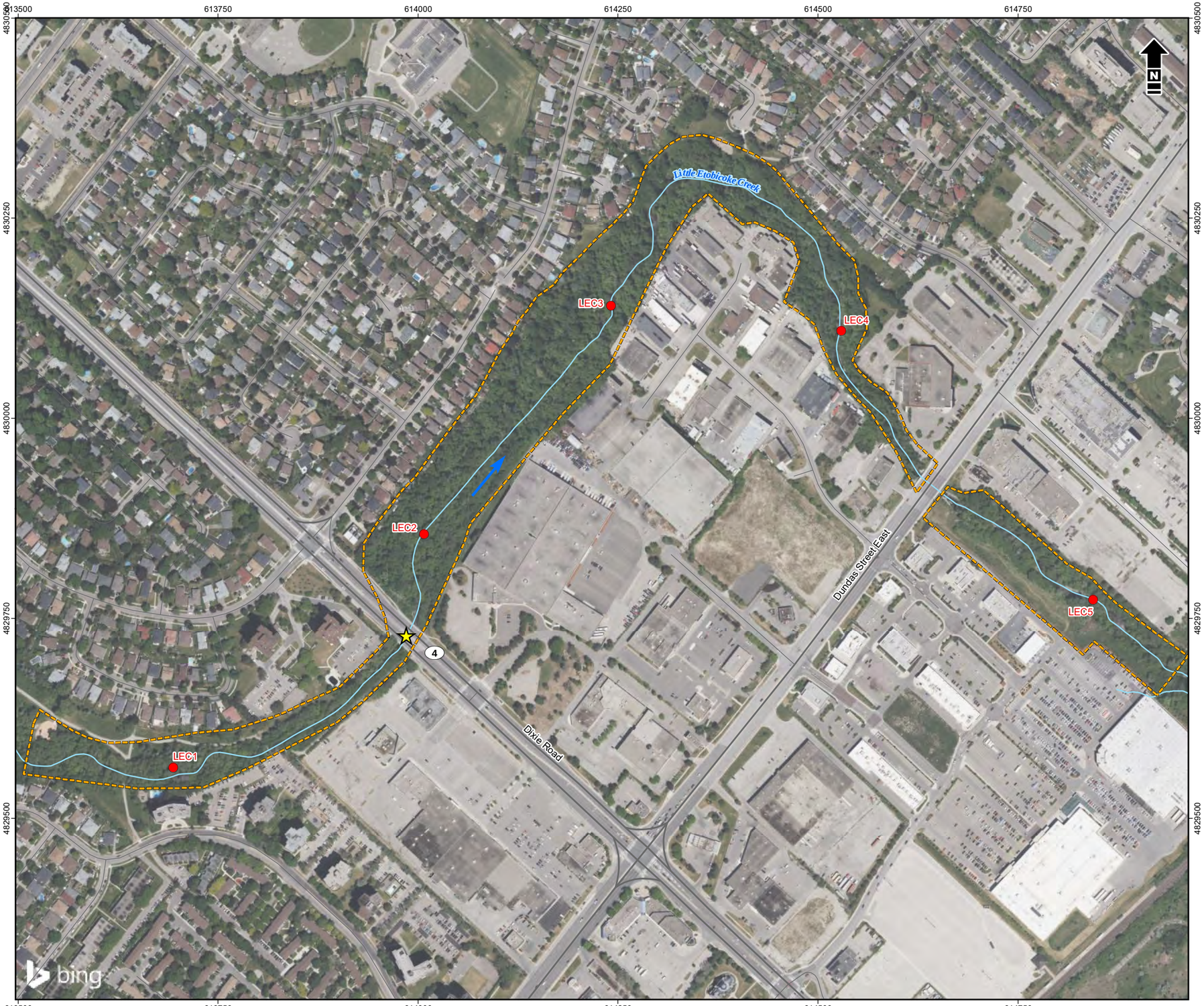

- Natural Heritage Study Area
- Watercourse
- Flow Direction
- Highway
- Road
- Dixie Road Bridge
- Fish Sampling Site

1:5,000 metres

50 0 50 100

NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
A Montrose Environmental Company

City of Mississauga
Dixie-Dundas Flood Mitigation

Fish Sampling Sites

Date:	Project:	Submitter:	Reviewer:
November 2023	24603	E. Wilkinson	R. Leppington

Figure 2

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5 Existing Natural Environment

Characterization of the natural environment is provided in the following subsections. A complete list of species observed during field investigations, as well as in the background review, is located in Appendix A. Site photographs are presented in Appendix B.

5.1 Topography

The major physiographic regions in the Etobicoke watershed include the South Slope and Lake Iroquois Sand Plain. The South Slope begins south of the Oak Ridges Moraine and slopes toward Lake Ontario. It is characterized by a smooth, faintly drumlinized, clay till plain, and a deeply incised stream valley (TRCA 2010). The Lake Iroquois Sand Plain is comprised of sand, silt, and clay deposits, with the finer materials being closer to the current Lake Ontario shoreline (TRCA 2010). The geology of Little Etobicoke Creek is comprised predominately of clay loam within the upper reaches of the creek and sandy loam, sand, and clay near the mouth of the creek (TRCA 2010).

The watershed consists of three major land uses, including: 63% urban, 22% rural, and 15% natural land cover. The majority of urban land use is made up of industrial, commercial, and residential buildings occupying approximately 49% of the watershed (TRCA 2010).

5.2 Terrestrial Habitat

5.2.1 Vegetation Communities

Vegetation communities within the study area are mapped on Figure 3 and described in further detail in Table 4**Error! Reference source not found.**. ELC data collected through the TRCA was available for the study area, with the exception of the study area east of Dundas Street East. The TRCA ELC data was confirmed, where available, and ELC data was collected in the area east of Dundas Street East to determine vegetation communities. In total, eight terrestrial ELC communities and one aquatic community were documented.

Table 4 Ecological Land Classification Communities

Ecological Land Classification Community Type	Community Description
FOD7-a Fresh-Moist Manitoba Maple Lowland Deciduous Forest Local Rank: L5	This community was characterized by a dominant Manitoba Maple (*Acer negundo*) canopy and subcanopy followed by Norway Maple (*Acer platanoides*) and Common Buckthorn (*Rhamnus cathartica*). The ground cover consisted primarily of non-native species such as Garlic Mustard (*Alliaria petiolate)* and Sweet Violet (*Viola odorata*) as well as native Goldenrod species (*Solidago sp*.). This community has a local rank of L5 indicating this community is common and secure within the region.

Ecological Land Classification Community Type	Community Description
FOD7-b Fresh-Moist Norway Maple Lowland Deciduous Forest Local Rank: L+	This community was characterized by Norway Maple and Manitoba Maple within the canopy and subcanopy followed by Goldenrod species and Garlic Mustard within the groundcover layer. This community has a local rank of L+ indicating this community is dominated by non-native species within the canopy.
FOD7-3 Fresh-Moist Willow Lowland Deciduous Forest Local Rank: L5	This community was characterized by Willow species (*Salix sp.)* and Manitoba Maple within the canopy followed by Manitoba Maple, Norway Maple and Green Ash (*Fraxinus pennsylvanica)* within the subcanopy. The understory and ground cover were comprised of Virginia Creeper (*Parthenocissus quinquefolia*), Bittersweet Nightshade (*Solanum dulcamara*), Red Raspberry (*Rubus idaeus*), and Goldenrod species. This community has a local rank of L5 indicating this community is common and secure within the region.
FOD7-2 Fresh-moist Ash Deciduous Forest Local Rank: L4	This community was characterized by Green Ash and Manitoba Maple within the canopy and Norway Maple, and White Mulberry (*Morus alba*) within the subcanopy. The understory and groundcover consisted of Virginia Creeper, Green Ash saplings, and Goldenrod species. This community has a local rank of L4 indicating that this community is generally secure in the rural matrix, but of conservation concern in the urban matrix.
CUP2-A Restoration Mixed Plantation Local Rank: L5	This community was characterized by Red Pine (*Pinus resinosa*), Manitoba Maple and Green Ash within the canopy and subcanopy. The understory and groundcover consisted of Wild Carrot (*Daucus carota*), Cow Vetch (*Vicia cracca*), and Virginia Creeper. This community has a local rank of L5 indicating this community is common and secure within the region.
CUW1-A3 Native Deciduous Successional Woodland Local Rank: L5	This community was characterized by Red Oak (*Quercus rubra*) and White Birch (*Betula papyrifera*) within the sparse canopy and Basswood (*Tilia Americana*), and Blue Beech (*Carpinus caroliniana*) within the subcanopy. The understory and groundcover consisted of Virginia Creeper, Stinging Nettle (*Urtica dioica*), and Philadelphia Fleabane (*Erigeron philadelphicus*). This community has a local rank of L5 indicating this community is common and secure within the region.
CUW1-b Exotic Successional Woodland Local Rank: L+	This community was characterized by Norway Maple, Manitoba Maple and Red Pine within the sparse canopy. The understory and groundcover contained Jewelweed (*Impatiens capensis*), Red Raspberry, Gray Dogwood (*Cornus racemosa*), and Goldenrod species. This community has a local rank of L+ indicating this community is dominated by non-native species within the canopy.

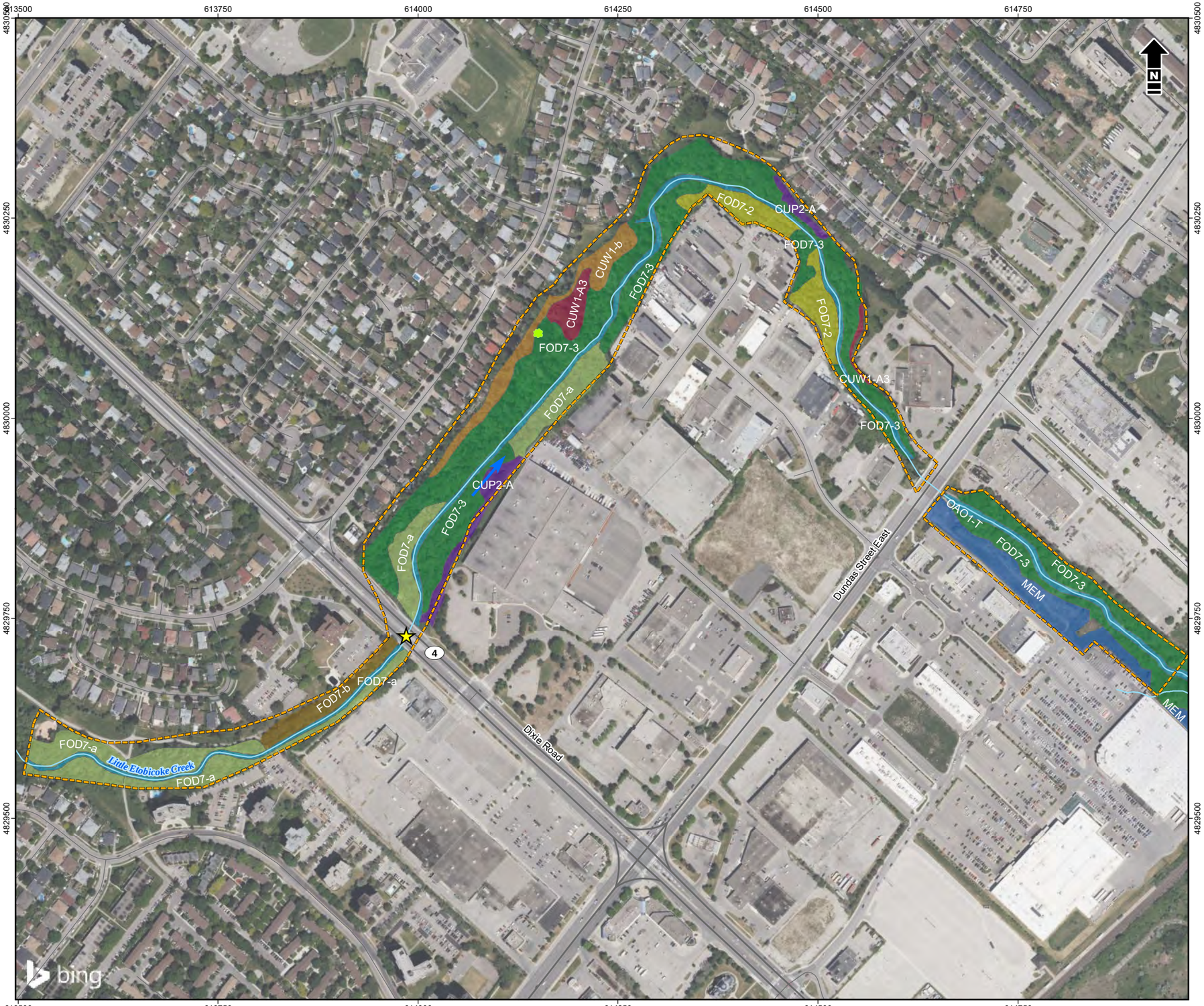
Ecological Land Classification Community Type	Community Description
MEM Mixed Meadow	This community was characterized by grasses and graminoid species. There were sporadic tree species that had been planted and shrubs along the fence line. Abundant species included Smooth Brome Grass, White Sweetclover, Wild Carrot, Creeping Thistle, and Purple Crownvetch. This community does not have a local ranking.
OAO1-T Turbid Open Aquatic Local Rank:-L+	This community included the open channel of Little Etobicoke Creek.

Easting (m)

613500 613750 614000 614250 614500 614750

Northing (m)

4830500 4830250 4830000 4829750 4829500



- Natural Heritage Study Area
- Watercourse
- Flow Direction
- Highway
- Road
- Dixie Road Bridge
- Butternut

Ecological Land Classification

- OAO1-T | Turbid Open Aquatic
- CUP2-A | Restoration Mixed Plantation
- CUW1-A3 | Native Deciduous Successional Woodland
- CUW1-B | Exotic Successional Woodland
- FOD7-2 | Fresh-Moist Ash Deciduous Forest
- FOD7-3 | Fresh-Moist Willow Lowland Deciduous Forest
- FOD7-a | Fresh-Moist Manitoba Maple Lowland Deciduous Forest
- FOD7-b | Fresh-Moist Norway Maple Lowland Deciduous Forest
- MEM | Mixed Meadow

1:5,000 metres

50 0 50 100

NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
A Montrose Environmental Company

City of Mississauga
Dixie-Dundas Flood Mitigation

Ecological Land Classification

Date:	Project:	Submitter:	Reviewer:
November 2023	24603	E. Wilkinson	R. Leppington

Figure 3

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5.2.2 Flora

A total of 118 vascular plant species were identified within the study area through the botanical inventories and the TRCA field data from 2018. Of the 118 species identified, 58 (49.15%) species are considered native to the City of Toronto, 58 (49.15%) are considered non-native, and 2 (1.69%) was unclassified (Table 5Table 5). This high proportion of non-native species coincides with results from the Mississauga NAS that found that 43% to 52% of the species present within the study area were introduced (City of Mississauga, 2020). A full list of vegetation species found during the background review and field surveys can be found in Appendix A.

The majority of the native species (81%) were ranked as S5 (secure in Ontario). One SAR (Butternut) was observed within the study area. SAR species, as well as additional SAR flora potential, are discussed in Section 6.6.

A total of five species identified within the study area are considered locally rare (L3 ranked) and include Balsam Fir (*Abies balsamea*), Butternut (*Juglans cinerea*), Ninebark (*Physocarpus opulifolius*), Red Pine (*Pinus resinosa*), Slippery Elm (*Ulmus rubra*), and White Spruce (*Picea glauca*). An additional 15 species were identified within the study area that are ranked locally as L4 which means they are of conservation concern in the urban matrix. One Honey Locust (*Gleditsia triacanthos*) was observed. Naturally occurring Honey Locusts have an S2 designation and are classified as SCC, however, planted specimens receive no protections. Since the observed individual was a thornless variety, it is assumed to have been planted and does not qualify as SCC.

5.2.2.1 Floristic Quality Assessment

Floristic Quality Index (FQI) is a weighted species richness estimate used to compare natural areas in order to evaluate their conservation value. FQI is calculated by multiplying the mean Coefficient of Conservatism (CC) by the square root of the total number of native species present within a natural area (Oldham et al. 1995). FQI results in a number that represents the relative level of floristic quality for a given area and can be compared to FQIs of other areas.

The FQI score is 28.23, which indicates a moderate floristic quality. The quality of the native components of the study area as a whole was moderate, suggesting the study area contains mainly species that are adapted to a wide range of disturbances such as changes in hydrology, light levels, and nutrients (Table 5Table 5). The mean CC is 3.71, mean CC values that are under four indicate that the site is primarily vegetated with adaptable species that can withstand a variety of habitat changes. Table 5**Error! Reference source not found.** identifies the quantity of plant species within each coefficient of wetness category.

Table 5 Floristic Summary and Assessment of Results

Species Diversity		
Total Species	118	-
Native Species	58	49.15%
Exotic Species[1]	58	49.15%
Unknown ranking	2	1.69%
Regionally Rare Species (S1 to S3)	2	-
S1 to S3 Native Species	2	1.69%
S4 Native Species	9	7.63%
S5 Native Species	47	39.83%
SNA Non-native Species	58	49.15%
SU Species	2	1.69%
Coefficient of Conservatism (CC)		
CC Mean (native)[2]	3.71	Medium
CC 0 to 3	23	39.66%
CC 4 to 6	32	55.17%
CC 7 to 8	3	5.17%
CC 9 to 10	0	0.00%
Floristic Quality Index (FQI)		
FQI (native)[3]	28.23	Moderate

Notes:
(1) some species are excluded from the calculation as they are currently unranked in CC.
(2) High = >4.00; Medium = 3.30 to 3.99; Low = <3.30.
(3) High = >35; Moderate = 20 to 35; Low = 1 to 19.

5.2.3 Incidental Wildlife Observations

Incidental wildlife observations are important as they may provide species identification that was not included in any specific survey. Incidental observations were conducted as part of the study and are summarized in Appendix A.

Of the species incidentally observed, one SCC species, Eastern Wood-pewee (*Contopus virens*), and one SAR, Chimney Swift (*Chaetura pelagica*), were observed within the study area. The SCC species are discussed in Section 5.2.6 and Appendix C and SAR are discussed further in Section 6.6.

A total of three wildlife species identified within the study area are considered locally rare (L2 or L3 ranked) and include Black-and-White Warbler (*Mniotilta varia*), Golden-crowned Kinglet (*Regulus satrapa*) and Yellow-bellied Sapsucker (*Sphyrapicus varius*) (Appendix A). An additional 21 species were identified within the study area that are ranked locally as L4 which means they are of conservation concern in the urban matrix.

5.3 Aquatic Resources

Little Etobicoke Creek originates north of Highway 401 in the South Slope physiographic region and flows in a general southeast direction to its confluence with Etobicoke Creek within the Iroquois Sand Plain physiographic region just upstream of The Queensway. Dominant land use within the study area consists of industrial activity in the upper subwatershed and low-medium density residential developments in the lower subwatershed. The Etobicoke Creek Aquatic Ecosystem Report (TRCA 2006) identifies Little Etobicoke Creek as a second order stream with an approximate length of 16.0 km. It has assigned a habitat classification of “small riverine warmwater” for the entire length of Little Etobicoke Creek (TRCA 2006). Small riverine warmwater systems have low mean baseflow, fluctuating water temperatures, drainage areas less than 10 km^2, and typically have fish communities dominated by cyprinids, Johnny Darter, and Fantail Darter (TRCA 2006).

5.3.1 Aquatic Habitat

5.3.1.1 Upstream of Dixie Road

Upstream of Dixie Road for approximately 500 m, Little Etobicoke Creek flowed as a defined watercourse with a slight winding pattern within a narrow natural corridor through a highly urbanized environment. Both banks contained a narrow band of mature deciduous forest approximately 8 to 20 m wide along the survey reach. Within the study area, the channel was considered entrenched with a clearly defined stream bed and an abrupt floodplain slope break. Both banks of the channel for the entire survey reach were considered stable and lined with large armour stones stacked three or four high in a slight step pattern which made it difficult to establish bankfull within the channel. The channel was densely shaded by large overhead deciduous trees and overhanging shrubs in the understory. Several large fallen trees crossed the channel resting on the armour stones along top of bank throughout the reach (Figure 5a).

A paved pedestrian path/trail was present along both banks and crossed the channel via two wooden pedestrian walking bridges approximately 200 m and 400 m upstream of Dixie Road. Approximately 30 m upstream of the first pedestrian bridge (230 m upstream of Dixie Road), a small side channel approximately 10 m long originating from a stormwater outfall contributed to the watercourse channel from the north bank. A second stormwater outfall channel joined the watercourse from the south bank immediately downstream of the second pedestrian bridge.

Channel morphology within the reach was fairly homogenous and consisted of long slow run sections interspersed with short riffles and sporadic shallow mid-channel pools. Several riffles between Dixie Road and the first pedestrian bridge were created by small bedrock drops in the stream bed. Run sections had a mean depth of 0.4 m with a wetted width of 6.0 m. Substrates in runs consisted mainly of gravel, sand, and cobble overlying bedrock. Riffles had a mean depth of 0.15 m with an average wetted width of 7.2 m. Substrates in riffles were dominated by bedrock, boulder, and cobble with pockets of gravel. Pool areas had a mean depth of 0.60 m with an average wetted width of 8.0 m. Substrates in pools were primarily gravel, sand, and cobble overlying bedrock. Bankfull measurements for all morphological features were not collected due to the presence of armour stones along the bank which made it difficult to establish true bankfull elevations within the reach.

Riparian vegetation within the study area consisted primarily of large deciduous trees and shrubs along both banks with grasses and herbaceous plants for ground cover. No instream vegetation was observed within the channel.

Habitat within the reach was limited and included cover provided by boulders and large cobbles and crevices in the bedrock and armour stone along the bank. Small amounts of overhanging woody debris and overhanging vegetation provided additional habitat opportunities. Suitable habitat to complete the various life cycle processes for the warm water bait/forage fish species present was observed throughout the reach. Gravid female Creek Chub and Blacknose Dace exhibiting spawning colouration were captured during an electrofishing survey (details in Section 5.3.2) indicating that the reach provides rearing/nursery habitat and probable spawning habitat for these species.

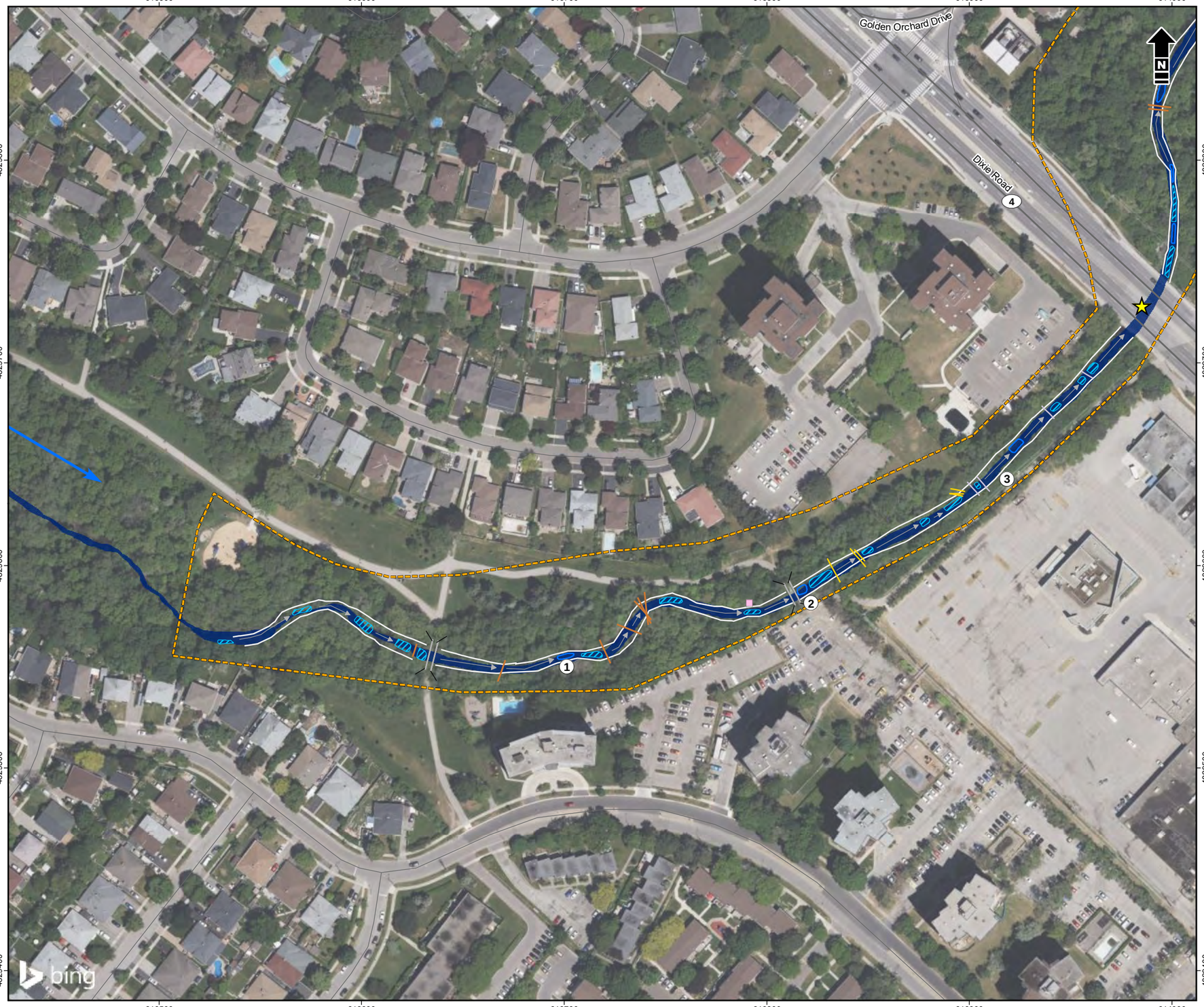
DRAFT

Easting (m)

613500 613600 613700 613800 613900 614000

Northing (m)

4829800 4829700 4829600 4829500 4829400



- Warm water Bait/Forage Fish Habitat
- Natural Heritage Study Area
- Pool
- Riffle
- Watercourse
- Flow Direction
- Highway
- Road
- Armourstone/Gabion Basket
- Fallen Tree
- Small Bedrock Knickpoint
- Woody Debris
- Pedestrian Bridge
- Run
- Field Note
- Dixie Road Bridge
- Outfall

Notes:
1. Pool with a wetted width of 5.6,, wetted depth of 0.6m. Armour stone banks, with overhanging deciduous trees. Gravel, sand, and cobble substrate
2. Riffle with a wetted width of 7.2m and wetted depth of 0.15m. Armourstone banks with overhanging deciduous trees. Cobble, boulders and gravel substrate.
3. Run with a wetted width of 8m and wetted depth of 0.30m. Armourstone banks with overhanging deciduous trees. Gravel, sand and cobble substrate.

General Comments:
- Both banks lined with large armour stone stacked four stones high in slight step pattern.
- Informal trails through deciduous forest areas on both banks.
- Thin layer of substrates overlying bedrock throughout survey reach
- Channel well shaded by overhanging shrubs and trees on both banks.

Index Map

Reference: Contains information licensed under the Open Government Licence – Ontario. Contains data obtained by Matrix Solutions Inc. and the City of Mississauga. Imagery: Service Layer Credits: © 2023 Microsoft Corporation © 2023 Maxar ©CNES (2023) Distribution Airbus DS

1:2,000 metres
20 0 20 40
NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
A Montrose Environmental Company

City of Mississauga
Dixie-Dundas Flood Mitigation

Fish Habitat
Upstream of Dixie Road

Date:	Project:	Submitter:	Reviewer:
November 2023	24603	E. Wilkinson	R. Leppington

Figure 5a

5.3.1.2 Downstream of Dixie Road

Similar to the section upstream of Dixie Road, the watercourse continued as a defined channel within a narrow natural corridor downstream of Dixie Road for approximately 700 m. The forested area along the banks was wider and varied from 25 to 55 m wide. The channel was densely shaded by large overhead deciduous trees and overhanging shrubs in the understory. Both banks of the channel were lined with large armour stones in a slight step pattern to provide bank stabilization during high flows. The armour stone wall continues for approximately 500 m downstream of Dixie Road, leaving the remaining 200 m until the crest of the large meander bend with natural banks (Figure 5b)

A paved pedestrian trail/path was present on the north bank with several small informal trails noted with the deciduous forest. Downstream of Dixie Road, the watercourse flowed along the south bank of the channel with a large, exposed cobble bar along the north side of the channel. Approximately 550 m downstream of Dixie Road, a small side channel enters from the north which creates a large pool (1 m depth) at the confluence.

Channel morphology within the reach downstream of Dixie Road consisted of a riffle/pool sequence with long riffle sections and a few shallow-deep pools. Mean depth within riffles was 0.2 m with an average wetted width of 6.0 m. Mean depth within pools was 0.5 m with an average wetted width of 5.5 m. Substrates within the reach consisted primarily of boulder, cobble, and bedrock with pockets of gravel and sand.

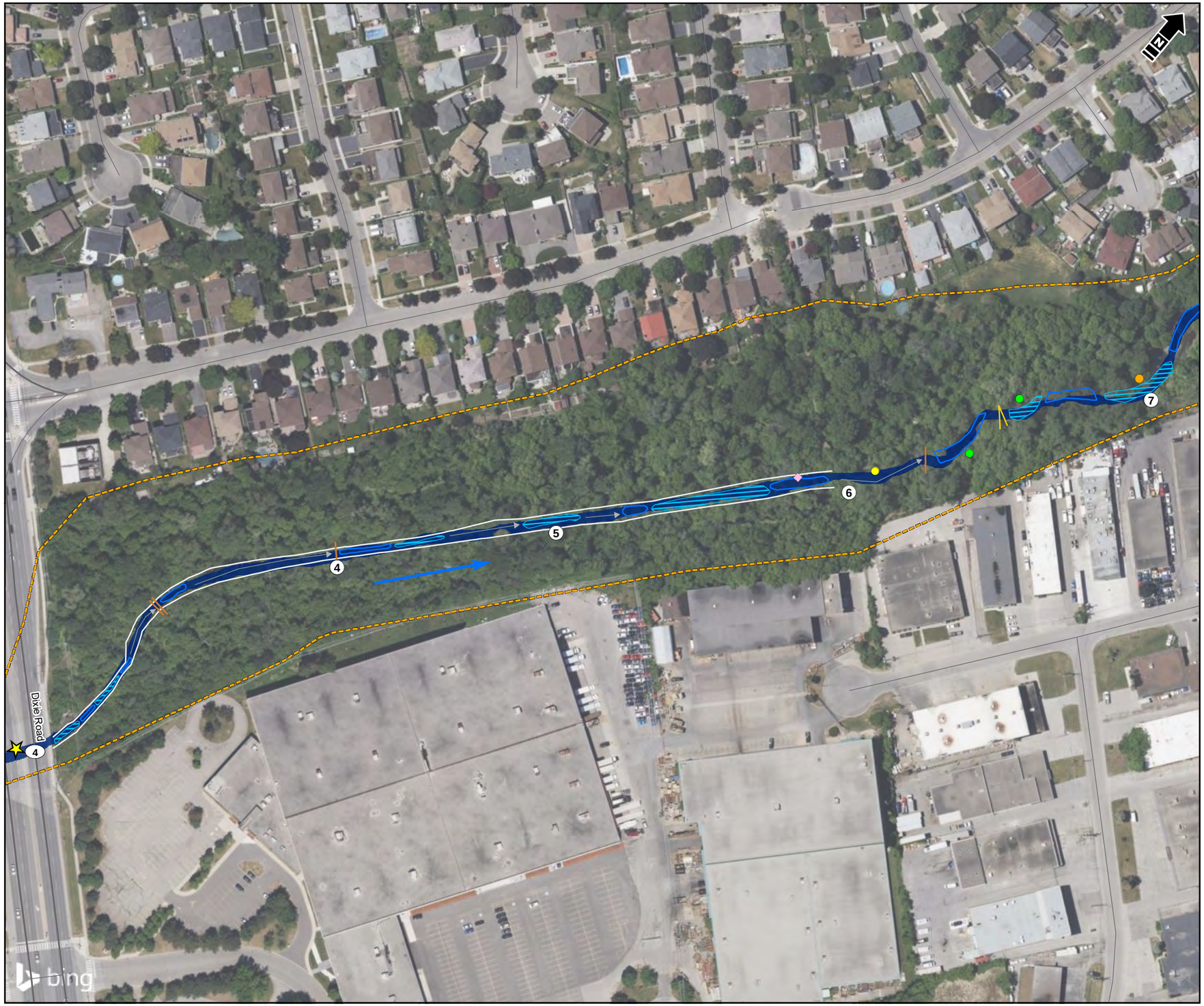
Riparian vegetation consisted of overhanging deciduous trees and shrubs with herbaceous plants and grasses for ground cover. Instream aquatic macrophyte growth primarily consisted of submergent algae which covered larger substrates.

Habitat immediately downstream of Dixie Road was limited; however, further downstream there was more naturalized bank habitat which provided undercut banks, exposed root wads, and woody debris. The majority of habitat provided consisted of instream boulders and cobble and crevices in bedrock and armour stone. Existing habitat provides sufficient opportunity for the warmwater bait/forage fish community present to complete their various lifecycle requirements. Gravid female Creek Chub and Blacknose Dace exhibiting spawning colouration were captured during an electrofishing survey (details in Section 5.3.2) indicating that the reach provides rearing/nursery habitat and probable spawning habitat for these species.

DRAFT

Easting (m)

Northing (m)



- Warm water Bait/Forage Fish Habitat
- Natural Heritage Study Area
- Pool
- Riffle
- Watercourse
- Flow Direction
- Highway
- Road
- Armourstone/Gabion Basket
- Fallen Tree
- Woody Debris
- Run
- Field Note
- Dixie Road Bridge
- Outfall
- Sand Bar
- Cobble Bar
- Undercut

Notes:
4.Pool with a wetted width of 6m and a wetted depth of 0.52m. Armourstone banks with overhanging deciduous trees. Substrate comprised of cobble, gravel with sand overlay and areas of exposed bedrock.
5. Riffle with a wetted width of 6m and wetted depth of 0.18m. Armourstone banks with overhanging deciduous trees. Substrate comprised of cobble, boulder and exposed bedrock.
6. Pool with a wetted width of 4m and depth of 0.50m. Armourstone ends and banks are natural with no armouring. Substrate is sand and exposed clay.

Index Map

1:2,000 metres
20 0 20 40
NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
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City of Mississauga
Dixie-Dundas Flood Mitigation

Fish Habitat
Downstream of Dixie Road

Date:	Project:	Submitter:	Reviewer:
November 2023	24603	E. Wilkinson	R. Leppington

Figure 5b

I:\City\Mississauga\24603\Figures\andTables\ECL\2019\Report\Figure-5b-Fish_Habitat_Downstream_of_Dixie_Road.mxd - Tabloid_L - 16-Nov-23, 10:29 AM - sylam - TID005

5.3.1.3 Upstream of Dundas Street East

The section of channel upstream of Dundas Street for approximately 500 m had a mix of bank treatments which included large boulders at the crest of the meander bend, gabion baskets at the downstream extent of the bend, armour stone at the most downstream extent, and intermittent naturalized banks. Overall, the area was shaded by overhanging deciduous trees; however, the forested riparian community narrowed from an approximate width of 30 m close to Dixie Road to a 5 m width approaching Dundas Street (Figure 5c).

The crest of the large meander bend contained a riffle feature with large circular cobbles and boulders within the channel. A large sand bar developed downstream of the riffle into a small pooled habitat. The pools contained large substrates such as cobbles and boulders, with an overlay of silt and sand. Substrate within the riffles consisted primarily of cobbles, boulders, and gravel with areas of exposed bedrock. The armouring of the banks changed to gabion baskets which created a long deep pooled system with depths of 0.70-0.80 m deep and 5 m wetted width for approximately 50 m. Naturalized banks were present moving downstream toward Dundas Street. The naturalized banks had areas of undercutting (0.26 m), wood debris, and a mixture of pool, riffle and run habitats. The riffle and run habitats ranged between 0.15 - 0.26 m wetted depths and consisted primarily of cobbles, boulders, and gravel with areas of exposed bedrock. The channel began to narrow with a wetted width of 3 m and armour stone along the west bank. The presence of armour stone increased approaching Dundas Street with a large pool (0.88 m deep).

The majority of habitat provided consisted of instream boulders and cobble, and crevices in bedrock and armour stone. In some of the more naturalized area, there were habitat features such as undercut banks, root wads, and wood debris. The results of the electrofishing survey (details in Section 5.3.2) indicated the presence of a warmwater baitfish community. Existing habitat provides opportunity for the warmwater bait/forage fish community present to complete their various lifecycle requirements. Throughout the reach there were schools of young of the year fish which were observed within the sandy pooled habitats. This indicates that this reach provides rearing/nursery habitat and confirmed spawning habitat for these species.

DRAFT

Easting (m)

614200 614300 614400 614500 614600 614700

Northing (m)

4830300 4830200 4830100 4830000 4829900

- Warm water Bait/Forage Fish Habitat
- Natural Heritage Study Area
- Pool
- Riffle
- Watercourse
- Highway
- Road
- Armourstone/Gabion Basket
- Fallen Tree
- Woody Debris
- Run
- Field Note
- Outfall
- Sandbar
- Cobble Bar
- Undercut
- Overhanging Banks
- Vertical Bank

Notes:
7. Riffle with wetted width of 2m and wetted depth of 0.16m. Right bank has vertical banks, Left bank has large cobble bar. Confulence of tributary. Woody debris in centre channel at the end of riffle.
8. Pool with wetted width of 5m and wetted depth of 0.82m. Boulders/cobble with sand and silt overlay. Falling gabion baskets along the banks.
9. Run with etted eidth of 5m and wetted depth of 0.43m. Left bank has under cutting with woody debris along right bank. Substrate contains large cobble, boulders and exposed bedrock.
10. Pool with 5m wetted width and 0.88m wetted depth. Left bank is vertical and bare. Substrate is silt, sand and cobble.

Index Map

1:2,000 metres
20 0 20 40
NAD 1983 UTM Zone 17N

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City of Mississauga
Dixie-Dundas Flood Mitigation

Fish Habitat
Upstream of Dundas Street

Date:	Project:	Submitter:	Reviewer:
November 2023	24603	E. Wilkinson	R. Leppington

Figure 5c

5.3.1.4 Downstream of Dundas Street East

The section of the channel downstream of Dundas Street East for approximately 360 m had a mix of bank treatments which included armour stone and gabion baskets at the most upstream extent near Dundas Street East, intermittent naturalized banks with terrace formations, or steeply eroded banks. Overall, the area was partially shaded by overhanging deciduous trees (Figure 5d).

Channel morphology of the stream consisted of a series of riffles, pools, and runs. Riffles averaged a depth of 5 to 40 cm deep, with a wetted width of 1 to 4 m wide, gradually narrowing further downstream. Pools averaged a depth of 0.8 to 1.5 m with a wetted width of 5 to 9.5 m. Runs averaged a depth of 15 to 50 cm with a wetted width of 6 to 9.5 m. Substrates varied within the reach consisting of large cobble, cobble, and some sand and gravel or mostly cobble with sand and gravel.

Starting at the Dundas Street East culvert there was a run that featured large flat rocks covered in filamentous algae with cobbles in between. Further downstream at the end of the armour stone headwalls the channel transitioned into a riffle feature with large cobble consisting of natural stone and concrete blocks, cobble, and some sand and gravel. After a 30 to 40 cm drop, there was a pool that was completely shaded under an overhanging tree that had fallen across the waterway. The right bank was lined with gabions, the ones submerged in the water had been washed out creating an artificial undercut bank (0.30 m) that transitioned from a run into a pool that was concentrated on the right bank along the gabions and back into a run. At the end of the gabions the left bank became very steep and undercut (0.28 m) with woody debris, while the right bank was a cobble bar with overhanging vegetation. This was followed by a pool that was 80 cm deep that switched to a run containing some metal debris. The next riffle had a gentler slope followed by a pool with terraced slopes on the right bank. The left bank contained woody and metal debris and exposed roots. Moving further downstream through another riffle and pool there was more debris on the right bank with evidence of filter cloth on the left bank. The last riffle was near the SWM outlet on the left bank with the right bank being heavily eroded, exposing soil and tree roots. The last pool had undercut banks and slumping or evidence of slumping with exposed tree roots.

Riparian vegetation consisted of overhanging deciduous trees and shrubs with herbaceous plants and grasses for ground over. Filamentous algae was present on some rocks within the stream.

The majority of habitat provided consisted of instream boulders and cobble, washed out and undercut gabion cages, overhanging fallen trees as well as multiple sections containing woody debris with some undercut banks and exposed roots. The results of the electrofishing survey (details in Section 5.3.2) indicated the presence of a warmwater baitfish community. Existing habitat provides opportunity for the warmwater bait/forage fish community present to complete their various lifecycle requirements. There was a Blacknose Dace with spawning colouration captured during the electrofishing survey indicating that the reach provides rearing/nursery habitat and probable spawning habitat for this species.

DRAFT

Easting (m)

614600 614650 614700 614750 614800 614850 614900 614950

Northing (m)

4829950 4829900 4829850 4829800 4829750 4829700

Dundas Street East

1 2 3

bing

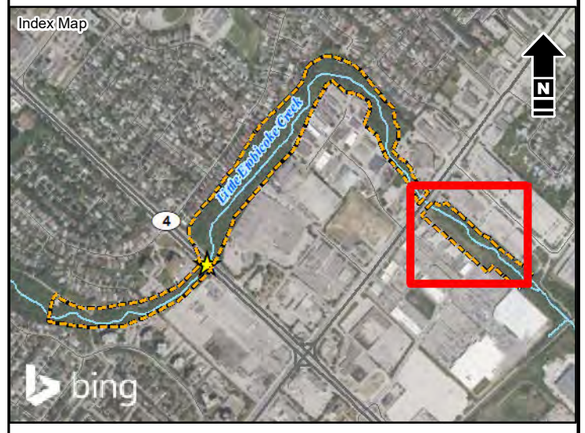
N

- Natural Heritage Study Area
- Warm water Bait/Forage Fish Habitat
- Outfall
- Pool
- Riffle
- Watercourse
- Highway
- Road
- Run
- Armourstone/Gabion Basket
- Fallen Tree
- Small Cinderblock Retaining Wall
- Woody Debris
- Field Note
- Large Rock
- Cobble Bar
- Undercut
- Vertical Bank

Notes:
1. Pool with wetted width of 8m and wetted depth of 1m approximately. Right bank is lined with failing gabions, left bank slopes gradually with overhanging deciduous vegetation. Mostly sandy gravel with 10% cobble substrate underlined with clay.
2. Run with a wetted width of 9.5m and wetted depth of 15cm approximately. Right bank slopes gently, left bank is steeper with exposed roots. Both banks are heavily vegetated. Cobble, sand, gravel substrate.
3. Riffle with wetted width of 4m and wetted depth of 10cm approximately. Right bank heavily eroded with exposed soil and roots, left bank eroded due to an outlet. Cobble substrate with minimal large cobble and small gravel.

General Comments:
- Armour stone present closer to the Dundas St E overpass with failing gabions on the left bank for a portion of the reach.
- Right bank generally slopes more gently with the left bank being steeper and more eroded.
- Informal trails through deciduous forest areas on both banks.
- Channel generally shaded by overhanging shrubs and trees on both banks.

Index Map



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1:1,200 metres
10 0 10 20
NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
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City of Mississauga
Dixie-Dundas Flood Mitigation

Fish Habitat
Downstream of Dixie Road

Date:	Project:	Submitter:	Reviewer:
November 2023	24603	E. Wilkinson	R. Leppington

Figure 5d

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5.3.2 Fish Community

The background review identified historical fisheries information for Little Etobicoke Creek from 1946 to 1991 and more recent records in the Lower Etobicoke Creek from 2001 to 2016 (TRCA 2006; TRCA 2019b) approximately 1.1 km downstream of Dundas Street (Table 6). The historical fisheries data indicates that presence of various common warmwater and cool water species, with the exception of the Redside Dace (Clinostomus elongatus), which is listed as Endangered both provincially and federally. However, the record of Redside Dace is considered historical, as it has not been observed in Little Etobicoke Creek since 1946.

Table 6 Historical Fisheries Data at Little Etobicoke Creek Within and Surrounding the Study Area

Common Name	Scientific Name	SARA[(1)]	ESA[(2)]	Little Etobicoke 1946-1991	Lower Etobicoke 2001-2016
Eastern Blacknose Dace	Rhinichthys atratulus	-	-	X	X
Bluntnose Minnow	Pimephales notatus	-	-	X	X
Brook Stickleback	Culaea inconstans	-	-	X	-
Central Stoneroller	Campostoma anomalum				X
Common Shiner	Luxilus cornutus	-	-	X	X
Creek Chub	Semotilus atromaculatus	-	-	X	X
Fathead Minnow	Pimephales promelas	-	-	X	-
Golden Shiner	Notemigonus crysoleucas	-	-	-	X
Johnny Darter	Etheostoma nigrum	-	-	X	X
Longnose Dace	Rhinichthys cataractae	-	-	X	X
Rainbow Darter	Etheostoma caeruleum	-	-	X	-
Redside Dace	Clinostomus elongatus	Endangered (Schedule 1)	Endangered	X	-
Rock Bass	Ambloplites rupestris	-	-	X	-
White Sucker	Catostomus commersonii	-	-	X	X

Notes:
(1) Species at Risk Act (SARA; Government of Canada 2021)
(2) Endangered Species Act, 2007 (ESA; Government of Ontario 2021a)

In 2019, Matrix conducted an electrofishing survey at four stations throughout the Little Etobicoke Creek study area (Figure 2). The stations were located 200 m upstream of Dixie Road (LEC1), 50 m and 400 m downstream of Dixie Road (LEC2 and LEC3), and 200 m upstream of Dundas Street (LEC4). In 2021,

Matrix conducted an electrofishing survey at one additional station downstream of Dundas Street East (LEC5). The station was located approximately 250 m downstream of the culvert, with a total of 60 m of creek surveyed. A total of 85 fish across 7 species were caught in across the 2019 and 2021 fish community surveys (Table 7Table 7). All the species captured are considered to be common, tolerant, warmwater/coolwater species within Ontario.

Table 7 Fish Community Results for Little Etobicoke Creek in 2019 and 2021

Species Common Name	LEC1	LEC2	LEC3	LEC4	LEC5[(1)]
Central Stoneroller	-	-	1	-	-
Creek Chub	8	8	1	-	-
Eastern Blacknose Dace	3	1	5	10	2
Longnose Dace	1	3	19	16	4
White Sucker	1	1	-	-	-
Brown Trout	-	-	-	-	1
Total	13	13	26	26	7

Notes:
(1) Survey conducted in 2021

6 Significant Natural Heritage Features and Functions

Significant natural heritage features and functions include those listed in the Provincial Policy Statement (MMAH 2020), and the NHRM (MNR 2010). Reference was also obtained from the natural heritage system from the City's Official Plan (City of Mississauga 2021). The findings of the site investigations were cross-referenced with the criteria provided in these documents in order to identify the confirmed or potential presence of significant natural heritage features.

The following significant features were not present within 120 m of the study area:

- ANSIs
- Environmentally Significant Areas
- Provincially Significant Wetlands
- Wetlands or Unevaluated Wetlands

Significant features that are present within the study area are discussed further in Sections 6.1 to 6.6.

6.1 Significant Valleylands and Corridors

Valleylands are linear natural areas that occur in a valley or other landform depressions that have water flowing through or standing for some period of the year (MNR 2010). These areas are important corridors which provide unique features and functions to an area as well as linkages between terrestrial and aquatic habitats.

Little Etobicoke Creek and associated valley lands are a part of the City's "Significant Natural Areas" (City of Mississauga 2021). The overall function of the adjacent natural lands associated with Little Etobicoke Creek play a meaningful role in the urban landscape and it is considered a significant valleyland.

6.2 Significant Woodlands

Section 6.3.12 of the City's Official Plan (City of Mississauga 2021) states the criteria needed to meet the significant woodlands designation within the City of Mississauga. Since the woodland surrounding Little Etobicoke Creek is a continuous system which is greater than 0.5 ha and is within 30 m of a watercourse, it is considered a significant woodland (City of Mississauga 2021).

6.3 Fish and Fish Habitat

As presented in Section 5.3, the study area does contain fish as well as permanent fish habitat within Little Etobicoke Creek.

Fish and fish habitat are regulated by Fisheries and Oceans Canada (DFO) under the Fisheries Act (Government of Canada 2019). The Fisheries Act requires that projects avoid causing the death of a fish or a harmful alteration, disruption or destruction (HADD) of fish habitat unless authorized by the Minister or a designated representative (Government of Canada 2019). The determination of death of fish or HADD is typically done through a self-assessment process.

6.4 Linkages and Corridors

Linkages and corridors are important features within a natural system. These features are continuous, often linear bands of vegetation in the landscape which provide opportunities to connect natural areas and provide cover for wildlife movement and dispersal of otherwise isolated populations.

Little Etobicoke Creek has been designated as a significant valleyland. This area represents a significant linkage for both terrestrial and aquatic organisms. The wooded riparian area along the edge of the creek provides a linkage to other natural areas within the system.

6.5 Species at Risk

A total of 17 SAR and 14 SCC were identified as having records occurring within or in the vicinity of the study area during the Matrix background review. This number was refined based on habitat characteristics present within the study area as observed through field investigations. The screening determined there is a moderate probability for six SAR and four SCC, and a confirmed presence of two SAR and one SCC. The list below provides a description of the species with confirmed or moderate probability of occurrence within the study area. The full screening can be found in Appendix C.

6.5.1 Confirmed SAR

Butternut: A Butternut was observed within the study area. This species is designated as Endangered under the ESA and SARA, however only the ESA would apply in the case of this project. The protection under the ESA only applies to pure Butternut individuals. To identify whether a Butternut is a pure species or a hybrid it must be assessed by a Butternut Health Assessor. If the tree is identified as a pure species and works will occur within 25 m of the tree, then the project will need to be registered under the MECP Notice of Activity.

Chimney Swift: this species is designated as Threatened under ESA and SARA. This species utilizes chimneys for nesting and roosting during the breeding season. The ESA general habitat protection identifies chimneys used for roosting and nesting purposes (Government of Ontario 2021a). Within the study area, Chimney Swifts were observed flying over the study area foraging for insects. Although this species was recorded within the study area, there were no suitable nesting chimneys observed.

6.5.2 Moderate Probability SAR

SAR Bats [Tri-colored Bat (*Perimyotis subflavus*); Northern Myotis (*Myotis septentrionalis*); Little Brown Myotis (*Myotis lucifugus*)]: The forested ravine habitat (primarily east of Dixie Road and east of Dundas Street East) has been identified as potential suitable habitat for SAR bat species. These species and their habitats are protected under the ESA. In order to confirm the presence or absence of these SAR bat species utilizing the potential habitat identified in Section 5.2.4.1 and depicted in Figure 5, an acoustic survey is required following the Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis, Northern Myotis & Tri-Coloured Bat (MNRF 2017). Acoustic surveys would only be required if a tree or forested area identified as potential suitable habitat would be impacted or removed as part of project construction. If the potential SAR habitat is occupied by SAR bats, the project will need approval or permitting from the MECP for the removal of any confirmed SAR bat habitat.

Bank Swallow (*Riparia riparia*): Bank swallow is listed as Threatened both provincially and federally. This species can be found breeding in vertical faces such as lake and riverbanks, soil stockpiles, and sand and gravel pits. Foraging habitat consists of open areas such as meadows, pastures, and grasslands. Candidate habitat exists along any eroded vertical banks within Little Etobicoke Creek.

Eastern Whip-poor-will (*Antrostomus vociferus*): Eastern Whip-poor-will is listed as Threatened both provincially and federally. This species can be found in areas that contain a mix of open and forested habitat such as open woodlands, forests with openings, and savannahs. Candidate habitat exists within the FOD communities within the study area that are surrounded by open meadow.

Red-headed Woodpecker (*Melanerpes erythrocephalus*) – Red-headed Woodpecker is listed as Endangered provincially and threatened federally. This species can be found in woodlands and woodland edges, including oak and beech forests, grasslands, orchards, riparian forests, beaver ponds,

burns, parks, golf courses, and cemeteries. Dead trees are used for nesting and perching. Candidate habitat exists within the FOD communities within the study area.

6.5.3 Confirmed SCC

Eastern Wood-pewee (*Contopus virens*) – Eastern Wood-pewee is listed as Special Concern both provincially and federally. This species can be found in the mid-canopy layer of forest clearings, edges of deciduous and mixed forests, early successional clearings, coniferous forests, mixed forests, deciduous forests, deciduous swamps, mixed swamps, and cultural woodlands. An eastern wood-pewee was heard vocalizing during the 2019 field visits, suitable habitat was present within the FOD communities within the study area.

6.5.4 Moderate Probability SCC

Canada Warbler (*Cardellina canadensis*) – Canada Warbler is listed as Special Concern both provincially and federally. This species can be found in deciduous or coniferous forests with a well-developed, dense shrub layer; commonly in wet or riparian areas. This may also include stands that are regenerating after natural disturbances. Candidate habitat exists within the FOD communities within the study area.

Wood Thrush (*Hylocichla mustelina*) – Wood Thrush is listed as Special Concern provincially and Threatened federally. This species can be found in mature deciduous and mixed forests, or in moist stands of trees with well-developed undergrowth. Their nests are built in live saplings, trees, or shrubs, especially sugar maple or American beech. Candidate habitat exists within the FOD communities within the study area.

Barn Swallow (*Hirundo rustica*) – Barn Swallow is listed as Special Concern both provincially and federally. This species constructs its cup-shaped mud nests on rough-cut wood surfaces on human-made structures such as open barns, under bridges, and in culverts. This species forages in grassy fields, pastures, cropland, lake and river shorelines, cottage areas, farmyards, islands, wetlands, and tundra. Candidate nesting habitat exists along the bridges and culverts within the study area, candidate foraging habitat exists along the creek.

Monarch (*Danaus plexippus*) – Monarch is listed as Special Concern both provincially and federally. This species is found in open or disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests where milkweed is present. Milkweed was observed within the study area during field visits, candidate habitat exists wherever milkweed is present.

6.5.5 Bat Maternity Roosting Survey

The Tri-coloured Bat and the two Myotis species require different roosting habitat characteristics. Little Brown Myotis and Northern Myotis roost in-tree cavities, crevices, and exfoliating bark in wooded areas located near water. The Tri-coloured Bat most often roosts in foliage (both dead and alive) within or

below the canopy. Often, Oak (*Quercus*) species are utilized for roosting because the leaves are retained longer in the fall season; however, Maple (*Acer*) species are also used. Tri-coloured Bats forage along riparian corridors and open water.

Identifying suitable roost trees for Little Brown Myotis and Northern Myotis included recording the locations and decay classes of all snags that exhibited appropriate attributes including cavities, loose bark, cracks, or knot holes. Decay class is an important consideration when ranking the quality of roosting habitat, with trees in early stages of decay typically being of higher quality than those in later stages of decay. Each snag tree was ranked into a decay class of 1 through 6. Class 1 has the least amount of decay present, and class 6 has the most. Class 1-3 trees are typically preferred for roosting because their bark and wood are still mostly intact, offering greater protection from the elements compared to a more decayed tree that has lost all its bark and whose wood has been decomposing for many years. **Error! Reference source not found.** summarizes the suitable maternity roost trees for Little Brown Myotis and Northern Myotis throughout the entire study area.

Table 8 Summary of Little Brown Myotis and Northern Myotis Suitable Roost Trees within Study Area (Leaf-off Survey)

Tree Number	Tree Species	Diameter at Breast Height (DBH)	Decay Class
1	unknown species	28	5
2	Maple sp.	35	4
3	**Willow sp.**	**50**	**2**
4	Willow sp.	55	5
5	Willow sp.	50	5
6	**Willow sp.**	**55**	**2**
7	Willow sp.	60	4
8	**Oak sp.**	**24**	**2**
9	unknown species	22	4
10	**Maple sp.**	**40**	**2**
11	**Maple sp.**	**37**	**2**
12	Maple sp.	20/20	5
13	Maple sp.	25	4
14	Maple sp.	30	4
15	unknown species	20	4
16	**Maple sp.**	**50/40**	**2**
17	unknown species	24	4
18	Ash sp.	15/15/15	5
19	**Willow sp.**	**65**	**1**
21	**Willow sp.**	**50/45**	**2**
22	**Willow sp.**	**70/70/60**	**2**

Tree Number	Tree Species	Diameter at Breast Height (DBH)	Decay Class
25	Eastern Cottonwood	70/70	4
26	unknown sp.	30	6
27	**Ash sp.**	**30**	**3**
28	**Eastern Cottonwood**	**50**	**3**
29	**unknown sp.**	**32**	**3**
30	**Ash sp.**	**15**	**3**
31	Maple sp.	20	4
32	Eastern Cottonwood	50/25	5

Notes:
Trees in bold indicate high-quality snag trees.

A total of 34 snags greater than 10 cm DBH were recorded during the snag evaluation, of which 29 are within the Dixie Dundas study area. 13 of the 29 trees located within the study area are considered high-quality snags.

Identifying suitable roost habitat for Tri-coloured Bats included recording the location of Oak trees greater than 10 cm DBH, Maple trees greater than 10 cm DBH if they included dead leaf clusters, and Maple trees greater than 25 cm DBH (dead leaf cluster or not). **Error! Reference source not found.** summarizes the suitable maternity roost trees for Tri-Coloured bats throughout the entire study area.

Table 9 Summary of Tri-Coloured Bat Suitable Roost Trees within Study Area (Leaf-on Survey)

Tree Number	Tree Species	Diameter at Breast Height (DBH)	Tree Status	Dead/Dying Leaf Cluster
1	Red Oak	44	Live	No
2	Red Oak	36	Live	No
3	Red Oak	41	Live	No
4	Red Oak	54/50	Live	No
5	Red Oak	51	Live	No
6	White Oak	13	Live	No

A total of six large diameter oak trees were recorded within the study area. In addition to the oak species specified in **Error! Reference source not found.**, there was a large quantity of maple trees (Manitoba maple [*Acer negundo*] and Norway maple [*Acer platanoides*]) throughout the study area that were greater than 25 cm DBH. No maple trees were recorded with visible dead leaf clusters. Although maple species are usually only recorded if Oak species are absent from the study area the oaks recorded were found in a central location downstream of Dixie Road; therefore, maple species were assessed as well. Maple trees were located in six of the eight vegetation community types. The 25 high-quality snag

trees, oak trees, and ELC polygons containing maples greater than 25 cm DBH are considered potential SAR bat habitat and have been mapped to avoid their removal where possible (Figure 5).

Easting (m)

613500 613750 614000 614250 614500 614750 615000

Northing (m)

4830500 4830250 4830000 4829750 4829500 4829250

N

FOD7-3 FOD7-2 CUP2-A CUW1-A3 CUW1-b FOD7-a FOD7-b CUP2-A OAO1-T MEM Dundas Street East Dixie Road Little Etobicoke Creek 4

Natural Heritage Study Area
Area with Maples >25 cm DBH
Watercourse
Flow Direction
Highway
Road
Dixie Road Bridge
Butternut
Leaf-On Assessment - Oaks and Maples
Leaf-Off Assessment - Snags

Ecological Land Classification

OAO1-T | Turbid Open Aquatic
CUP2-A | Restoration Mixed Plantation
CUW1-A3 | Native Deciduous Successional Woodland
CUW1-B | Exotic Successional Woodland
FOD7-2 | Fresh-Moist Ash Deciduous Forest
FOD7-3 | Fresh-Moist Willow Lowland Deciduous Forest
FOD7-a | Fresh-Moist Manitoba Maple Lowland Deciduous Forest
FOD7-b | Fresh-Moist Norway Maple Lowland Deciduous Forest
MEM | Mixed Meadow

1:6,000 metres
60 0 60 120
NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
A Montrose Environmental Company

City of Mississauga
Dixie-Dundas Flood Mitigation

Potential Bat Maternity Roosting Habitat

Date:	Project:	Submitter:	Reviewer:
November 2023	24603	E. Wilkinson	R. Leppington

Figure 4

I:\City\Mississauga\24603\Figures\and\Tables\ECL\2019\Report\Figure-4-Potential_Bat_Maternity_Roosting_Habitat.mxd - Tabloid_L - 29-Oct-21, 03:14 PM - lmwright - TID005

6.6 Significant Features and Functions Summary

Based on the background review and site investigations to date, the potential and confirmed significant features and functions that are present within the study area are summarized below and depicted in Figure 6:

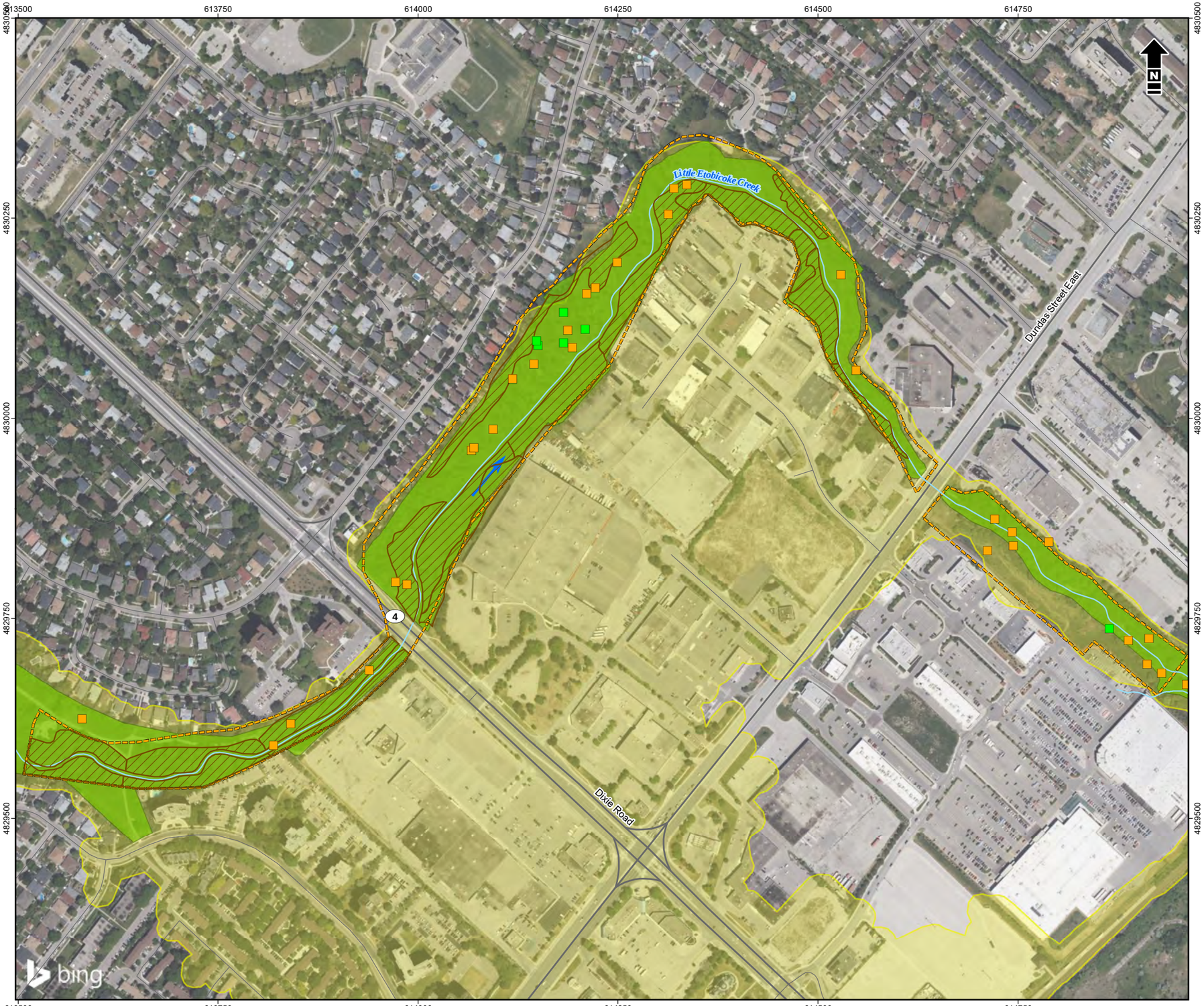
- Significant woodland (confirmed)
- Significant valleyland (confirmed)
- Fish and fish habitat (confirmed)
- Confirmed SAR and SCC:
    - Butternut (SAR)
    - Chimney Swift (SAR)
    - Eastern Wood-pewee (SCC)
- Moderate probability of occurrence for six SAR and four SCC

Easting (m)

613500 613750 614000 614250 614500 614750

Northing (m)

4830500 4830250 4830000 4829750 4829500



- Natural Heritage Study Area
- TRCA Regulation Limit
- Significant Natural Areas and Natural Green Spaces
- Watercourse
- Flow Direction
- Highway
- Road
- Potential SAR Bat Habitat - Snag
- Potential SAR Bat Habitat - Oak Tree
- Potential SAR Bat Habitat - Maple Trees

Reference: Contains information licensed under the Open Government Licence – Ontario. Contains data obtained by Matrix Solutions Inc. and the City of Mississauga. Imagery: Service Layer Credits: © 2024 Microsoft Corporation © 2024 Maxar ©CNES (2024) Distribution Airbus DS

1:5,000 metres
50 0 50 100
NAD 1983 UTM Zone 17N

Matrix Solutions Inc.
A Montrose Environmental Company

City of Mississauga
Dixie-Dundas Flood Mitigation

Natural Heritage Features and Buffers

Date:	Project:	Submitter:	Reviewer:
March 2024	24603	E. Wilkinson	R. Leppington

Figure 6

I:\City\Mississauga\24603\Figures\and\Tables\ECL\2019\Report\Figure-6-Natural_Heritage_Features_and_Buffers.mxd - Tabloid_L - 15-Mar-24, 06:45 AM - aperez - TD\005

7 Description of Alternatives

7.1 Dixie Area Alternative Solutions

Three alternative solutions were developed for the Dixie Area that represented a different approach to keep flow within the valley corridor. All alternatives would require some tree removals, although some more than others. All alternatives would also require some short-term impacts to the aquatic ecosystem during construction, but no long-term effects would occur once the watercourse has stabilized.

7.1.1 Dixie AS1: Improved Conveyance with a Minimized Footprint

Dixie AS1 centres around improving water conveyance through an oversized and incised channel. 600 m of the channel would be lowered by approximately 1 m. The channel would be widened but would not be well-connected to the floodplain. This alternative would require a new bridge span at Dixie Road of 26 m, and Dixie Road would need to be raised by approximately 1.7 m.

From an ecological perspective, Dixie AS1 would have the lowest impacts to the terrestrial environment, with 2.27 ha of treed areas being impacted to reconstruct the Dixie Road bridge and lower the channel. The existing vegetation along the valley would remain. No opportunities for recreational amenities or fish habitat improvements are present with this alternative.

7.1.2 Dixie AS2: Improved Conveyance by Making Room for Little Etobicoke Creek

Dixie AS2 centres around improving conveyance through a lowered and widened channel and a connected and lowered floodplain. 600 m of the channel would be lowered by approximately 0.5 m to create a low-flow channel. Floodplain shelves would be added to convey water when low-flow conditions are exceeded. This alternative would require two new bridge spans at Dixie Road of 45 m total length, and Dixie Road would need to be raised by approximately 0.4 m.

From an ecological perspective, Dixie AS2 would require the most tree removals along the project study area to widen the valley and channel corridor, with 3.77 ha of treed areas being impacted. The butternut tree identified within this area is not anticipated to be directly impacted; however, the 25 m surrounding buffer would be infringed upon. A mitigation plan for this tree (should the butternut health assessment show it to be a pure butternut), would be required. Should acoustic surveys identify bat presence within the study area, mitigation for the removal of SAR bat roosting trees would also be required. Given the high percentage of non-native tree species within the wooded area, the removal of vegetation along the corridor would present an opportunity to revegetate the corridor with more valuable native species. Additionally, this alternative presents the highest potential for fish habitat improvements.

7.1.3 Dixie AS3: Flood Containment with Mitigation for Upstream Impacts

Dixie AS3 centres around containing flood flows within the existing valley corridor by using a flood protection landform (FPL; a permanent massive earthen structure with an engineered clay core). The FPL would extend 1.25 km along Little Etobicoke Creek. Minor channel widening would also occur, no channel lowering would be required. This alternative would require a new bridge span at Dixie Road of

28 m, and Dixie Road would need to be raised by approximately 2.5 m. The FPL's large footprint would also cause significant property impacts.

From an ecological perspective, Dixie AS3 would some vegetation removals along the south bank of Little Etobicoke Creek to accommodate the FPL, with 2.38 ha of treed areas being impacted. The FPL would also likely encroach onto existing trails, requiring their relocation or complete removal. No opportunities for additional recreational opportunities or fish habitat improvements are present with this alternative.

7.1.4 Dixie Do Nothing

The do nothing alternative is a required solution as part of the Municipal Class EA process, to provide a reference comparison for the other alternative solutions. The Dixie Do Nothing approach would not cause any disturbance to the terrestrial ecosystem because there would be no construction. For the aquatic ecosystem, there would be no opportunities for fish habitat improvement, and continued erosive flows would continue to degrade the habitat quality.

7.1.5 Preferred Alternative

Overall, Dixie AS2 is the preferred alternative. Although it is the alternative with the greatest amount of tree removals, the removals provide an opportunity to revegetate the stream corridor with a selection of native species that provide greater ecological value than the existing tree community that is comprised of a large percentage of non-native species. Although this restoration will provide a long-term benefit to the community, it should be acknowledged that it will take several decades for the planted trees to grow to maturity and start providing the desired ecosystem services. In the interim, there will be a medium-term net loss as wildlife will not be able to utilize the young forest to the same degree as they presently use the mature, non-native forest. From an aquatic perspective, Dixie AS2 provides the greatest opportunity for fish habitat improvement through increased connectivity between the creek and its floodplain.

7.2 Dundas Area Alternative Solutions

Three alternative solutions were developed for the Dundas Area that represented a different approach to keep flow within the valley corridor. All alternatives would require tree removals, although AS1 and AS3 would require more than AS2.

7.2.1 Dundas AS1

Dundas AS1 includes a 25 m single-span bridge at Dundas Street with downstream floodplain conveyance improvements. Dundas Street East would need to be raised by approximately 0.75 m, resulting in a road disturbance length of 190 m. Conveyance improvements would include floodplain improvements and channel widening.

From an ecological perspective, Dundas AS1 would provide some opportunities for improved terrestrial connectivity through the downstream floodplain improvements. Tree removals would be required for the bridge replacement and channel widening (0.6 ha of impacted treed area) and for the floodplain

improvements (0.94 ha of impacted treed area), impacting a total of 1.55 ha of treed area. An additional 0.84 ha of mixed meadow community would be impacted. Most potential fish habitat improvements with no piers present to provide constraints.

7.2.2 Dundas AS2

Dundas AS2 includes a 38 m bridge span at Dundas Street with no downstream floodplain conveyance improvements. Dundas Street East would need to be raised by approximately 0.5 m, resulting in a road disturbance length of 140 m.

From an ecological perspective, Dundas AS2 would provide some opportunities for improved terrestrial connectivity through the larger bridge span. AS2 would require the smallest amount of tree removals since no floodplain improvements would occur. A total of 0.6 ha of treed area would be impacted with the bridge replacement and channel widening. An additional 0.01 ha of mixed meadow community would be impacted. Some potential fish habitat improvements, piers provide a habitat constraint.

7.2.3 Dundas AS3

Dundas AS3 includes a 38 m bridge span at Dundas Street with downstream floodplain conveyance improvements. Dundas Street East would need to be raised by approximately 0.2 m, resulting in a road disturbance length of 70 m. Conveyance improvements would include floodplain improvements and channel widening.

From an ecological perspective, Dundas AS3 would provide the most opportunities for improved terrestrial connectivity through the larger bridge span and downstream floodplain improvements. AS3 would require the same amount of tree removals as AS1, with the bridge replacement and channel widening (0.6 ha of impacted treed area) and the floodplain improvements (0.94 ha of impacted treed area) impacting a total of 1.55 ha of treed area. An additional 0.84 ha of mixed meadow community would be impacted. Some potential fish habitat improvements, piers provide a habitat constraint.

7.2.4 Dundas Do Nothing

The do nothing alternative is a required solution as part of the Municipal Class EA process, to provide a reference comparison for the other alternative solutions. The Dundas Do Nothing approach would not cause any disturbance to the terrestrial ecosystem because there would be no construction. For the aquatic ecosystem, there would be no opportunities for fish habitat improvement, and continued erosive flows would continue to degrade the habitat quality.

7.2.5 Preferred Alternative

Overall, Dundas AS1 is the preferred alternative. This alternative will have similar impacts on the terrestrial ecosystem as Dundas AS2 and AS3. All three will provide similar terrestrial connectivity improvements through the widened bridge span. Dundas AS1 and AS3 will require the most tree removals for the floodplain improvements and bridge replacement.

8 Recommendations and Permitting

Given the potential and confirmed natural heritage features and functions within the study area, the following recommendations have been identified to reduce long-term impacts to the site:

- A Butternut health assessment should be completed to identify whether the Butternut in question is a hybrid or a pure specimen.
- If the Butternut is a pure specimen, no construction works are to occur within 25 m of the Butternut. Any construction activities occurring within 25 m of the Butternut which could pose harm will be subject to an MECP Notice of Activity to register the project activities.
- Bat acoustic surveys should be completed to confirm the presence or absence of potential SAR bats if an individual tree or forested area identified as potential maternity roosting habitat will be impacted or removed. If SAR bats are present, approval for SAR bat habitat removal from the MECP will be required.
- No tree removals should be performed during the breeding bird window (April 1 to August 30) or the bat roosting window (April 1 to September 30). Should any vegetation clearing be required within the nesting season, a qualified avian biologist shall undertake nest sweeps prior to tree removal to ensure that no nests are present.
- No in-water works should be performed during the fisheries timing window for warm water species (April 1 to June 30). A fish salvage should be conducted prior to the commencement of in-water works, and fish exclusion measures should be installed and maintained throughout the duration of the works.
- Any in-water works will require a Request for Review to the DFO to determine if the project is in contravention of the Fisheries Act.
- Any works within the regulation limit will require a permit through the TRCA.
- Soil best management practices should be implemented during construction to protect the health of the soil and maximize the success of the restoration. This should include an erosion and sediment control plan, proper storage of topsoil for reuse, compaction avoidance measures, topsoil organic testing (if necessary), and topsoil amendments (if necessary).
- Wildlife exclusion fencing should be installed and maintained to ensure no SAR reptiles or amphibians enter the construction site.

9 Conclusion

Matrix was retained by the City to create a feasibility study for flood mitigation measures in Little Etobicoke Creek. Little Etobicoke Creek is an urban creek system which has been highly impacted by flood flows in recent years.

This NHS report has been developed in support of the feasibility study to identify the existing conditions of the natural heritage features within the study area. The results of the NHS indicate the presence of the following natural heritage features within the study area:

- Significant woodland
- Significant valleyland (Little Etobicoke Creek)
- Fish and fish habitat
- Confirmed SAR and SCC:
  - Butternut (SAR)
  - Chimney Swift (SAR)
  - Eastern Wood-pewee (SCC)
- Moderate probability of occurrence for six SAR and four SCC

Following the selection of the preferred alternative, a full impact assessment can be completed. The impact assessment will include recommended mitigation and compensation measures to maintain and/or improve the natural heritage features and functions of the study area.

10 References

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APPENDIX A
Wildlife Lists

TABLE 1 Bird Species

Species		Conservation Rank					Source							
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	OBBA [2]	eBird [3]	iNaturalist [4]	MECP Information Request (2021)	TRCA Data Request	Matrix Field Observations
Accipitridae	**Hawks, Kites, Eagles & Allies**												
Accipiter cooperii	Cooper's Hawk	S4						x	x	x			
Accipiter striatus	Sharp-shinned Hawk	S5						x	x				
Aquila chrysaetos	Golden Eagle	S1B, S4N	END						x				
Buteo jamaicensis	Red-tailed Hawk	S5						x	x	x			
Buteo platypterus	Broad-winged Hawk	S5B							x				
Circus cyaneus	Northern Harrier	S5B, S4N							x				
Haliaeetus leucocephalus	Bald Eagle	S4	SC					x	x				
Alaudidae	**Larks**												
Eremophila alpestris	Horned Lark	S4						x					
Alcedinidae	**Kingfishers**												
Megaceryle alcyon	Belted Kingfisher	S5B, S4N						x	x	x			x
Apodidae	**Swifts**												
Chaetura pelagica	Chimney Swift	S3B	THR	THR	THR		x	x	x		x	x	x
Anatidae	**Ducks, Geese & Swans**												
Aix sponsa	Wood Duck	S5B, S3N						x	x				
Anas discors	Blue-winged Teal	S3B,S4M						x					
Anas platyrhynchos	Mallard	S5						x	x	x		x	x
Anas rubripes	American Black Duck	S4						x					
Anas strepera	Gadwall	S4B, S4N, S5M						x					
Branta canadensis	Canada Goose	S5						x	x				
Cygnus buccinator	Trumpeter Swan	S4						x					
Cygnus olor	Mute Swan	SNA						x	x				
Lophodytes cucullatus	Hooded Merganser	S5						x					
Melanitta perspicillata	Surf Scoter	S4B/S5N							x				
Cygnus columbianus	Tundra Swan	S2B, S4N, S3M							x				
Mergus merganser	Common Merganser	S5						x	x	x			
Ardeidae	**Herons and Bitterns**												
Ardea herodias	Great Blue Heron	S4							x				
Butorides virescens	Green Heron	S4B						x					
Ixobrychus exilis	Least Bittern	S4B	THR	THR	THR			x					
Nycticorax nycticorax	Black-crowned Night-heron	S3B, S2N, S4M								x			
Bombycillidae	**Waxwings**												
Bombycilla cedrorum	Cedar Waxwing	S5						x	x	x			
Caprimulgidae	**Nightjars**												
Chordeiles minor	Common Nighthawk	S4B	SC	SC	SC			x					
Antrostomus vociferus	Eastern Whip-poor-will	S4B	THR	SC	THR		x						
Cardinalidae	**Cardinals, Grosbeaks & Allies**												
Cardinalis cardinalis	Northern Cardinal	S5						x	x	x		x	x
Passerina cyanea	Indigo Bunting	S5B						x	x	x		x	
Pheucticus ludovicianus	Rose-breasted Grosbeak	S5B						x	x	x			
Piranga olivacea	Scarlet Tanager	S5B						x	x				
Cathartidae	**Vultures**												
Cathartes aura	Turkey Vulture	S5B, S3N						x	x				
Certhiidae	**Creepers**												
Certhia americana	Brown Creeper	S5						x	x	x			x
Charadriidae	**Plovers**												
Charadrius semipalmatus	Semipalmated Plover	S4B, S5M							x				
Charadrius vociferus	Killdeer	S4B						x	x	x			
Columbidae	**Pigeons & Doves**												
Columba livia	Rock Pigeon	SNA						x	x	x			

Species		Conservation Rank					Source						
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	OBBA [2]	eBird [3]	iNaturalist [4]	MECP Information Request (2021)	TRCA Data Request	Matrix Field Observations
Zenaida macroura	Mourning Dove	S5						x	x	x			
Corvidae	**Crows & Jays**												
Corvus brachyrhynchos	American Crow	S5						x	x			x	
Corvus corax	Common Raven	S5						x	x				
Corvus ossifragus	Fish Crow	S1B, S3N						x					
Cyanpcitta cristata	Blue Jay	S5						x	x			x	x
Cuculidae	**Cuckoo & Anis**												
Coccyzus americanus	Yellow-billed Cuckoo	S4B						x					
Coccyzus erythropthalmus	Black-billed Cuckoo	S4S5B						x	x				
Emberizidae	**New World Sparrows & Allies**												
Ammodramus henslowii	Henslow's Sparrow	S1B	END	END	END		x						
Junco hyemalis	Dark-eyed Junco	S5							x	x			
Melospiza georgiana	Swamp Sparrow	S5B, S4N						x	x				
Melospiza lincolnii	Lincoln's Sparrow	S5B							x	x			
Melospiza melodia	Song Sparrow	S5						x	x	x			x
Passerculus sandwichensis	Savannah Sparrow	S5B, S3N						x	x				
Passerella iliaca	Fox Sparrow	S5B, S3N							x				
Pipilo erythrophthalmus	Eastern Towhee	S4B, S3N						x	x				
Spizella arborea	American Tree Sparrow	S5							x				
Spizella pallida	Clay-colored Sparrow	S4B							x				
Spizella passerina	Chipping Sparrow	S5B, S3N						x	x	x		x	x
Zonotrichia albicollis	White-throated Sparrow	S5							x	x			
Zonotrichia leucophrys	White-crowned Sparrow	S5B, S3N							x				
Spizella pusilla	Field Sparrow	S4B, S3N						x	x				
Falconidae	**Carcaras & Falcons**												
Falco columbarius	Merlin	S5						x	x	x			
Falco peregrinus	Peregrine Falcon	S4	SC					x		x	x		
Falco sparverius	American Kestrel	S4						x	x				
Fringillidae	**Finches & Allies**												
Acanthis flammea	Common Redpoll	S5							x				
Haemorhous mexicanus	House Finch	SNA						x	x	x			
Haemorhous purpureus	Purple Finch	S5							x				
Spinus pinus	Pine Siskin	S5							x				
Spinus tritis	American Goldfinch	S5						x	x			x	x
Gaviidae	**Loons**												
Gavia immer	Common Loon	S5							x				
Gruidae	**Cranes**												
Grus canadensis	Sandhill Crane	S5B, S3N							x				
Hirundinidae	**Swallows**												
Hirundo rustica	Barn Swallow	S4B	SC	SC	THR		x	x	x		x		
Petrochelidon pyrrhonota	Cliff Swallow	S4S5B						x					
Progne subis	Purple Martin	S3B						x	x				
Riparia riparia	Bank Swallow	S4B	THR	THR	THR			x			x		
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B						x	x				
Tachycineta bicolor	Tree Swallow	S4S5B						x	x				
Icteridae	**New World Blackbird**												
Agelaius phoeniceus	Red-winged Blackbird	S5						x	x	x		x	x
Dolichonyx oryzivorus	Bobolink	S4B	THR	SC	THR			x					
Euphagus carolinus	Rusty Blackbird	S4B, S3N	SC	SC	SC				x				
Icterus galbula	Baltimore Oriole	S4B						x	x	x		x	
Icterus spurius	Orchard Oriole	S4B						x	x				
Molothrus ater	Brown-headed Cowbird	S5						x	x			x	
Quiscalus quiscula	Common Grackle	S5						x	x	x		x	x
Sturnella magna	Eastern Meadowlark	S4B, S3N	THR	THR	THR			x					

Species		Conservation Rank					Source						
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	OBBA [2]	eBird [3]	iNaturalist [4]	MECP Information Request (2021)	TRCA Data Request	Matrix Field Observations
Laridae	**Gulls, Terns & Skimmers**												
Larus argentatus	Herring Gull	S4B, S5N							x				
Larus delawarensis	Ring-billed Gull	S5							x	x			
Sterna hirundo	Common Tern	S4B						x					
Mimidae	**Mockingbirds, Thrashers & Allies**												
Dumetella carolinsis	Gray Catbird	S5B, S3N						x	x			x	x
Mimus polyglottos	Northern Mockingbird	S4						x	x	x			
Toxostoma rufum	Brown Thrasher	S4B						x	x				
Motacillidae													
Anthus rubescens	American Pipit	S4B							x				
Pandionidae	**Osprey**												
Pandion haliaetus	Osprey	S5B						x					
Paridae	**Chickadees and Titmice**												
Poecile atricapillus	Black-capped Chickadee	S5						x	x	x		x	x
Parulidae	**Wood Warblers**												
Cardellina canadensis	Canada Warbler	S5B	SC	SC	THR				x		x		
Cardellina pusilla	Wilson's Warbler	S5B							x				
Geothlypis philadelphia	Mourning Warbler	S5B						x	x				
Geothylupis trichas	Common Yellowthroat	S5B, S3N						x	x			x	
Mniotilta varia	Black-and-white Warbler	S5B						x	x	x			x
Oreothlypis celata	Orange-crowned Warbler	S5B							x				
Oreothlypis peregrina	Tennessee Warbler	S5B							x				
Oreothlypis ruficapilla	Nashville Warbler	S5B							x				
Seiurus aurocapilla	Ovenbird	S5B						x	x				
Setophaga americana	Northern Parula	S5B							x	x			
Setophaga caerulescens	Black-throated Blue Warbler	S5B						x	x	x			
Setophaga castanea	Bay-breasted Warbler	S5B							x				
Setophaga coronata	Yellow Rumped Warbler	S5B, S4N							x	x			
Setophaga fusca	Blackburnian Warbler	S5B						x	x	x			
Setophaga magnolia	Magnolia Warbler	S5B							x	x			
Setophaga pensylvanica	Chestnut-sided warbler	S5B						x	x				
Setophaga petechai	Yellow Warbler	S5B						x	x				x
Setophaga pinus	Pine Warbler	S5B, S3N						x	x				
Setophaga ruticilla	American Redstart	S5B						x	x				
Setophaga striata	Blackpoll Warbler	S5B							x				
Setophaga tigrina	Cape May Warbler	S5B							x	x			
Setophaga virens	Black-throated Green Warbler	S5B							x	x			
Passeridae	**Sparrows**												
Passer domesticus	House Sparrow	SNA						x	x	x		x	
Phalacrocoracidae	**Cormorants**												
Phalacrocorax auritus	Double-crested Cormorant	S5B, S4N						x	x				
Phasianidae	**Patridges, Grouse, Turkeys**												
Meleagris gallopavo	Wild Turkey	S5							x				
Picidae	**Woodpeckers**												
Colaptes auratus	Northern Flicker	S5						x	x	x			
Dryocopus pileatus	Pileated Woodpecker	S5							x				
Leuconotopicus villosus	Hairy Woodpecker	S5						x	x			x	x
Melanerpes carolinus	Red-bellied Woodpecker	S5						x	x				
Melanerpes erythrocephalus	Red-headed Woodpecker	S3	END	END	END		x						
Picoides pubescens	Downy Woodpecker	S5						x	x				x
Sphyrapicus varius	Yellow-bellied Sapsucker	S5B, S3N							x	x			x
Podicipedidae	**Grebes**												
Podiceps grisegena	Red-necked Grebe	S3						x					
Podilymbus podiceps	Pied-billed Grebe	S4B, S2N						x					

Species		Conservation Rank					Source							
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	OBBA [2]	eBird [3]	iNaturalist [4]	MECP Information Request (2021)	TRCA Data Request	Matrix Field Observations
Polioptilidae	**Gnatcatchers**												
Polioptila caerulea	Blue-gray Gnatcatcher	S4B						x	x				
Rallidae	**Rails, Gallinules & Coots**												
Gallinula chloropus	Common Gallinule	S3B						x					
Rallus limicola	Virginia Rail	S4S5B						x					
Regulidae	**Kinglets**												
Regulus calendula	Ruby-crowned Kinglet	S5B, S3N							x				
Regulus satrapa	Golden-crowned Kinglet	S5							x	x			x
Scolopacidae	**Sandpipers, Phalaropes &Allies**												
Actitis macularius	Spotted Sandpiper	S5B						x		x			
Scolopax minor	American Woodcock	S4B						x		x			
Tringa solitaria	Solitary Sandpiper	S4B, S5M								x			
Sittidae	**Nutchatches**												
Sitta canadensis	Red-breasted Nuthatch	S5						x	x	x			
Sitta carolinensis	White-breasted Nuthatch	S5						x	x				x
Stercorariidae	**Skuas**												
Bubo virginianus	Great Horned Owl	S4						x	x	x			
Megascops asio	Eastern Screech Owl	S4								x			
Sturnidae	**Starlings**												
Sturnus vulgaris	European Starling	SNA						x	x	x			
Trochillidae	**Hummingbirds**												
Archilochus colubris	Ruby-throated Hummingbird	S5B						x	x				
Troglodytidae	**Wrens**												
Cistothorus palustris	Marsh Wren	S4B, S3N						x					
Thyrothorus ludovicianus	Carolina Wren	S4						x	x				
Troglodytes aedon	House Wren	S5B						x	x				
Troglodytes hiemalis	Winter Wren	S5B, S4N							x				
Turdidae	**Thrushes**												
Catharus fuscescens	Veery	S5B						x	x	x			
Catharus guttatus	Hermit Thrush	S5B, S4N							x	x			
Catharus minimus	Gray-cheeked Thrush	S4?B, S4M							x				
Catharus ustulatus	Swainson's Thrush	S5B							x	x			
Hylocichla mustelina	Wood Thrush	S4B	SC	THR	THR			x	x		x		
Sialia sialis	Eastern Bluebird	S5B, S4N						x					
Turdus migratorius	American Robin	S5						x	x	x		x	x
Tyrannidae	**Tyrant Flycatchers**												
Contopus virens	Eastern Wood-pewee	S4B	SC	SC	SC		x	x	x		x		x
Empidonax alnorum	Alder Flycatcher	S5B							x				
Empidonax flaviventris	Yellow-bellied Flycatcher	S5B							x				
Empidonax minimus	Least Flycatcher	S5B						x	x				x
Empidonax traillii	Willow Flycatcher	S4B						x	x				
Myiarchus crinitus	Great Crested Flycatcher	S5B						x	x				x
Sayornis phoebe	Eastern Phoebe	S5B						x	x				
Tyrannus tyrannus	Eastern Kingbird	S4B						x	x	x			
Vireonidae	**Vireos**												
Vireo gilvus	Warbling Vireo	S5B						x	x				
Vireo olivaceus	Red-eyed Vireo	S5B						x	x			x	
Vireo solitarius	Blue-headed Vireo	S5B							x	x			
Vireo flavifrons	Yellow-throated Vireo	S4B						x					
Vireo philadelphicus	Philadelphia Vireo	S5B							x				
Total							**6**	**110**	**131**	**53**	**7**	**19**	**24**

Notes:

S-rank

S1 - Critically Imperiled

COSEWIC

NAR - Not at Risk

Species		Conservation Rank					Source						
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	OBBA [2]	eBird [3]	iNaturalist [4]	MECP Information Request (2021)	TRCA Data Request	Matrix Field Observations

S2 - Imperiled
S3 - Vulnerable
S4 - Apparently Secure
S5 - Secure
SU - Unrankable
SNA - Unranked
SX - Presumed Extirpated
SH - Possibly Extirpated
S#? - Rank Uncertain

ESA
SC - Special Concern
THR - Threatened
END - Endangered
EXT - Extinct
EXP - Extirpated

Additional Notes
ESA - *Endangered Species Act*
COSEWIC - Committee on the Status of Endangered Wildlife in Canada
SARA - *Species at Risk Act*
NHIC - Natural Heritage Information Centre
OBBA - Ontario Breeding Bird Atlas

SC - Special Concern
THR - Threatened
END - Endangered
EXT - Extinct
EXP - Extirpated
DD - Data Deficient

SARA Schedule
Schedule 1 - Officially protected under SARA
Schedule 2 - threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
Schedule 3 - special concern; may be reassessed for consideration for inclusion to Schedule 1

COSSARO
NAR - Not at Risk
SC - Special Concern
THR - Threatened
END - Endangered
EXP - Extirpated
DD - Data Deficient

Sources:

1 Ontario Ministry of Natural Resources and Forestry (MNRF). 2024. *Make a Map: Natural Heritage Areas* . Mapping application. Accessed March 2024. https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html?viewer=Natural_Heritage.Natural_Heritage&locale=en-CA

2 Birds Canada et al. 2024. *Ontario Breeding Bird Atlas Data Summary Tool.* NatureCounts platform. Accessed March 2024. https://naturecounts.ca/nc/onatlas/findsquare.jsp

3 Cornell Lab of Ornithology. 2024. *eBird* . Accessed March 2024. https://ebird.org/home

3 iNaturalist. 2024. *Observations* . Accessed March 2024. https://www.inaturalist.org/observations

TABLE 2 Reptile and Amphibian Species

Species		Conservation Rank					Source			
Scientific Name	Common Name	Provincial (S-RANK)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Regional (Peel)	NHIC	ORAA	iNaturalist	Matrix Observations
Cryptodeira	**Turtles**									
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC		x	x		
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC		x	x	x	
Emydoidea blandingii	Blanding's Turtle	S3	THR	END	END			x		
Graptemys geographica	Northern Map Turtle	S3	SC	SC	SC			x	x	
Sternotherus odoratus	Eastern Musk Turtle	S3	SC	SC	SC			x		
Trachemys scripta elegans	Red-eared Slider	SNA						x		
Squamata	**Snakes**									
Diadophis punctatus	Ring-necked Snake	S4						x		
Lampropeltis triangulum	Eastern Milksnake	S4		SC	SC		x	x	x	
Nerodia sipedon sipedon	Northern Watersnake	S5						x	x	
Opheodrys vernalis	Smooth Greensnake	S4						x		
Storeria dekayi	DeKay's Brownsnake	S5						x	x	
Storeria occipitomaculata	Red-bellied snake	S5						x		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5						x	x	
Caudata	**Salamanders**									
Ambystoma hybrid pop. 1	Jefferson X Blue-spotted Salamander, Jefferson genome dominates	S2	END	END	END			x		
Ambystoma jeffersonianum	Jefferson Salamander	S2	END	END	END			x		
Ambystoma maculatum	Spotted Salamander	S4						x		
Necturus maculosus	Mudpuppy	S4						x		
Notophthalmus viridescens viridescens	Red-spotted Newt	S5						x		
Plethodon cinereus	Eastern Red-backed Salamander	S5						x	x	
Anura	**Frogs and Toads**									
Anaxyrus americanus	American Toad	S5						x	x	
Hyla versicolor	Gray Treefrog	S5						x		
Lithobates catesbeianus	American Bullfrog	S4						x		
Lithobates clamitans	Green Frog	S5						x		
Lithobates palustris	Pickerel Frog	S4						x		
Lithobates pipiens	Northern Leopard Frog	S5						x		
Lithobates sylvaticus	Wood Frog	S5						x		
Pseudacris crucifer	Spring Peeper	S5						x		
Pseudacris trisetaria pop. 1	Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield population)	S4		THR	THR			x		
Total:							**3**	**28**	**8**	**0**

TABLE 3 Fish Species

Species Name		Conservation Rank					Source						
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	iNaturalist [2]	DFO [3]	LIO [4]	Etobicoke Ceek Fish Data (TRCA)	Etobicoke Management Plan (TRCA)	Matrix Field Observations
Clupeiformes													
Alosa pseudoharengus	Alewife	SNA										x	
Dorosoma cepedianum	Gizzard Shad	S4										x	
Cypriniformes													
Campostoma anomalum	Central Stoneroller	S4									x	x	x
Carassius auratus	Goldfish	SNA								x		x	
Couesius plumbeus	Lake Chub	S5										x	
Cyprinus carpio	Common Carp	SNA										x	
Notemigonus crysoleucas	Golden Shiner	S5									x	x	
Notropis atherinoides	Emerald Shiner	S5										x	
Notropis heterodon	Blackchin Shiner	S4										x	
Notropis heterolepis	Blacknose Shiner	S5										x	
Notropis hudsonius	Spottail Shiner	S5										x	
Notropis stramineus	Sand Shiner	S4										x	
Chrosomus eos	Northern Redbelly Dace	S5										x	
Chrosomus neogaeus	Finescale Dace	S5								x			
Pimephales notatus	Bluntnose Minnow	S5								x	x	x	
Pimephales promelas	Fathead Minnow	S5								x		x	
Rhinichthys atratulus	Western Blacknose Dace	S5								x	x	x	x
Rhinichthys cataractae	Longnose Dace	S5								x	x	x	x
Semotilus atromaculatus	Creek Chub	S5								x	x	x	x
Luxilus cornutus	Common Shiner	S5								x	x	x	
Margariscus margarita	Northern Pearl Dace	S5										x	
Catostomus commersonii	White Sucker	S5								x	x	x	x
Hypentelium nigricans	Northern Hog Sucker	S4										x	
Esociformes													
Umbra limi	Central Mudminnow	S5										x	
Esox lucius	Northern Pike	S5										x	
Gasterosteiformes													
Culaea inconstans	Brook Stickleback	S5								x		x	
Gasterosteus aculeatus	Threespine Stickleback	S4S5								x		x	
Perciformes													
Aplodinotus grunniens	Freshwater Drum	S5										x	
Morone americana	White Perch	SNA										x	
Ambloplites rupestris	Rock Bass	S5								x		x	
Lepomis gibbosus	Pumpkinseed	S5								x		x	
Micropterus dolomieu	Smallmouth Bass	S5										x	
Micropterus salmoides	Largemouth Bass	S5										x	
Pomoxis nigromaculatus	Black Crappie	S4										x	
Etheostoma flabellare	Fantail Darter	S4										x	
Etheostoma nigrum	Johnny Darter	S5								x	x	x	
Etheostoma olmstedi	Tessellated Darter	S4										x	
Perca flavescens	Yellow Perch	S5								x			
Neogobius melanostomus	Round Goby	SNA										x	
Percopsiformes													
Percopsis omiscomaycus	Trout-perch	S5										x	
Salmoniformes													
Oncorhynchus tshawytscha	Chinook Salmon	SNA										x	
Oncorhynchus mykiss	Rainbow Trout	SNA										x	
Salmo trutta	Brown Trout	S5										x	x
Scorpaeniformes													
Cottus bairdii	Mottled Sculpin	S5										x	
Siluriformes													
Ameiurus nebulosus	Brown Bullhead	S5										x	
Anguilliformes													
Anguilla rostrata	American Eel	S1S2	END	THR									
Clinostomus elongatus	Redside Dace	S1	END	END	END								
Acipenseriformes													
Acipenser fulvescens pop. 1	Lake Sturgeon (Saskatchewan - Nelson River population)	S2	THR	END									
Acipenser fulvescens pop. 2	Lake Sturgeon (Southern Hudson Bay - James Bay population)	S3	SC	SC	SC								
Acipenser fulvescens pop. 3	Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)	S2	END	THR									
Polyodon spathula	Paddlefish	SX	EXP	EXP	EXP								
Amiiformes													
Amia calva	Bowfin	S4											
Atheriniformes													
Labidesthes sicculus	Brook Silverside	S4											
Characiformes													
Piaractus brachypomus	Redbellied Pacu	SNA											
Ctenopharyngodon idella	Grass Carp	SNA											
Exoglossum maxillingua	Cutlip Minnow	S2	THR	SC	SC								
Hybognathus hankinsoni	Brassy Minnow	S5											
Hybognathus regius	Eastern Silvery Minnow	S2											
Nocomis biguttatus	Hornyhead Chub	S4											
Nocomis micropogon	River Chub	S4											
Notropis anogenus	Pugnose Shiner	S2	THR	THR	THR								

Species Name		Conservation Rank					Source						
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	iNaturalist [2]	DFO [3]	LIO [4]	Etobicoke Ceek Fish Data (TRCA)	Etobicoke Management Plan (TRCA)	Matrix Field Observations
Notropis bifrenatus	Bridle Shiner	S2	SC	SC	SC								
Notropis buchanani	Ghost Shiner	S3											
Notropis photogenis	Silver Shiner	S2S3	THR	THR	THR								
Notropis rubellus	Rosyface Shiner	S4											
Notropis volucellus	Mimic Shiner	S5											
Scardinius erythrophthalmus	Rudd	SNA											
Semotilus corporalis	Fallfish	S4											
Cyprinella spiloptera	Spotfin Shiner	S4											
Erimystax x-punctatus	Gravel Chub	SX	EXP	EXP	EXP								
Luxilus chrysocephalus	Striped Shiner	S4											
Lythrurus umbratilis	Redfin Shiner	S4											
Macrhybopsis storeriana	Silver Chub (Great Lakes - Upper St. Lawrence populations)	S2	THR	END	END								
Opsopoeodus emiliae	Pugnose Minnow	S2	THR	THR	THR								
Carpiodes cyprinus	Quillback	S4											
Catostomus catostomus	Longnose Sucker	S5											
Erimyzon sucetta	Lake Chubsucker	S2	END	END	END								
Ictiobus cyprinellus	Bigmouth Buffalo	S2?											
Ictiobus niger	Black Buffalo	SNA			SC								
Minytrema melanops	Spotted Sucker	S2	SC	SC	SC								
Moxostoma anisurum	Silver Redhorse	S4											
Moxostoma carinatum	River Redhorse	S2	SC	SC	SC								
Moxostoma duquesnei	Black Redhorse	S2	THR	THR	THR								
Moxostoma erythrurum	Golden Redhorse	S4											
Moxostoma macrolepidotum	Shorthead Redhorse	S5											
Moxostoma valenciennesi	Greater Redhorse	S3											
Notropis blennius	River Shiner	S1?											
Cyprinodontiformes													
Fundulus diaphanus	Banded Killifish	S5											
Fundulus notatus	Blackstripe Topminnow	S2	SC	SC	SC								
Gambusia affinis	Western Mosquitofish	SNA											
Esox americanus vermiculatus	Grass Pickerel	S3	SC	SC	SC								
Dallia pectoralis	Alaska Blackfish	SNA											
Esox masquinongy	Muskellunge	S4											
Esox niger	Chain Pickerel	SNA											
Gadiformes													
Lota lota	Burbot	S5											
Apeltes quadracus	Fourspine Stickleback	SNA											
Pungitius pungitius	Ninespine Stickleback	S5											
Hiodontiformes													
Hiodon alosoides	Goldeye	S3											
Hiodon tergisus	Mooneye	S4											
Lepisosteiformes													
Lepisosteus oculatus	Spotted Gar	S1	END	END	END								
Lepisosteus osseus	Longnose Gar	S4											
Lepisosteus platyrhincus	Florida Gar	SNA											
Osmeriformes													
Osmerus mordax	Rainbow Smelt	S5											
Astronotus ocellatus	Oscar	SNA											
Parachromis managuensis	Jaguar Guapote	SNA											
Morone chrysops	White Bass	S4											
Lepomis cyanellus	Green Sunfish	S4											
Lepomis gulosus	Warmouth	S1	END	END	SC								
Lepomis humilis	Orangespotted Sunfish	SNA											
Lepomis macrochirus	Bluegill	S5											
Pomoxis annularis	White Crappie	S4											
Etheostoma blennioides	Greenside Darter	S4											
Etheostoma caeruleum	Rainbow Darter	S4											
Etheostoma exile	Iowa Darter	S5											
Etheostoma microperca	Least Darter	S4											
Ammocrypta pellucida	Eastern Sand Darter	S2	END	THR	THR								
Percina caprodes	Logperch	S5											
Percina copelandi pop 1	Channel Darter (Lake Erie population)	S1	SC	END	END								
Percina maculata	Blackside Darter	S4											
Percina shumardi	River Darter	S1	END	END									
Sander canadensis	Sauger	S4											
Sander vitreus vitreus	Walleye	S5											
Sander vitreus glaucus	Blue Pike	SX		EXT									
Gymnocephalus cernua	Ruffe	SNA											
Proterorhinus marmoratus	Tubenose Goby	SNA											
Lepomis peltastes	Northern Sunfish	S3	SC	SC	SC								
Petromyzontiformes													
Ichthyomyzon fossor	Northern Brook Lamprey	S3	SC	SC	SC								
Lethenteron appendix	American Brook Lamprey	S3											
Petromyzon marinus	Sea Lamprey	SNA											
Ichthyomyzon castaneus pop. 1	Chestnut Lamprey (Great Lakes-St Lawrence population)	S3		DD									
Ichthyomyzon unicuspis pop. 1	Silver Lamprey (Great Lakes - Upper St. Lawrence populations)	S3	SC	SC	SC								

Species Name		Conservation Rank					Source						
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	iNaturalist [2]	DFO [3]	LIO [4]	Etobicoke Ceek Fish Data (TRCA)	Etobicoke Management Plan (TRCA)	Matrix Field Observations
Ichthyomyzon unicuspis pop. 2	Silver Lamprey (Saskatchewan - Nelson River population)	SU		DD									
Ichthyomyzon castaneus pop. 2	Chestnut Lamprey (Saskatchewan - Nelson River population)	S1?		DD									
Pleuronectiformes													
Platichthys flesus	European Flounder	SNA											
Coregonus kiyi kiyi	Upper Great Lakes Kiyi	S3	SC	SC	SC								
Coregonus kiyi orientalis	Lake Ontario Kiyi	SX		EXT									
Salmo salar pop. 2	Atlantic Salmon - Lake Ontario Population	SX		EXT									
Coregonus artedi	Cisco	S5											
Coregonus clupeaformis	Lake Whitefish	S5											
Coregonus hoyi	Bloater	S4											
Coregonus johannae	Deepwater Cisco	SX		EXT									
Coregonus nigripinnis	Blackfin Cisco	SU		DD									
Coregonus reighardi	Shortnose Cisco	SH	END	END	END								
Coregonus zenithicus	Shortjaw Cisco	S2	THR	THR									
Oncorhynchus gorbuscha	Pink Salmon	SNA											
Oncorhynchus keta	Chum Salmon	SNA											
Oncorhynchus kisutch	Coho Salmon	SNA											
Oncorhynchus nerka	Sockeye Salmon	SNA											
Prosopium coulterii	Pygmy Whitefish	SU											
Prosopium cylindraceum	Round Whitefish	S4											
Salvelinus alpinus	Arctic Char	SU											
Salvelinus fontinalis fontinalis	Brook Trout	S5											
Salvelinus namaycush	Lake Trout	S5											
Thymallus arcticus	Arctic Grayling	SNA											
Salvelinus fontinalis timagamiensis	Aurora Trout	S1											
Coregonus clupeaformis pop. 1	Lake Whitefish (Lake Simcoe population)	SNR		DD									
Salvelinus namaycush x fontinalis	Splake	SNA											
Cyclopterus lumpus	Lumpfish	SNA											
Cottus cognatus	Slimy Sculpin	S5											
Cottus ricei	Spoonhead Sculpin	S4											
Myoxocephalus quadricornis	Fourhorn Sculpin	S2?											
Myoxocephalus thompsonii	Deepwater Sculpin (Great Lakes - Western St. Lawrence Populations)	S3?		SC	SC								
Ictalurus punctatus	Channel Catfish	S4											
Noturus flavus	Stonecat	S4											
Noturus gyrinus	Tadpole Madtom	S4											
Noturus insignis	Margined Madtom	SU		DD									
Noturus miurus	Brindled Madtom	S2											
Noturus stigmosus	Northern Madtom	S1	END	END	END								
Pylodictis olivaris	Flathead Catfish	SNA		DD									
Ameiurus melas	Black Bullhead	S4											
Ameiurus natalis	Yellow Bullhead	S4											
Panaque nigrolineatus	Royal Panaque	SNA											
Alosa sapidissima	American Shad	SNA											
Ictiobus bubalus	Smallmouth Buffalo	SNA											
Percina copelandi pop 2	Channel Darter (Lake Ontario population)	S2	SC	END	END								
Percina copelandi pop 3	Channel Darter (St. Lawrence population)	S3	SC	SC	SC								
Total							**0**	**0**	**0**	**15**	**9**	**43**	**6**

Notes:

S-rank
- S1 - Critically Imperiled
- S2 - Imperiled
- S3 - Vulnerable
- S4 - Apparently Secure
- S5 - Secure
- SU - Unrankable
- SNA - Unranked
- SX - Presumed Extirpated
- SH - Possibly Extirpated
- S#? - Rank Uncertain

ESA
- SC - Special Concern
- THR - Threatened
- END - Endangered
- EXT - Extinct
- EXP - Extirpated

Additional Notes
- ESA - *Endangered Species Act*
- COSEWIC - Committee on the Status of Endangered Wildlife in Canada
- SARA - *Species at Risk Act*
- NHIC - Natural Heritage Information Centre
- DFI - Fisheries and Oceans Canada
- LIO - Land Information Ontario

Sources:

COSEWIC
- NAR - Not at Risk
- SC - Special Concern
- THR - Threatened
- END - Endangered
- EXT - Extinct
- EXP - Extirpated
- DD - Data Deficient

SARA Schedule
- Schedule 1 - Officially protected under SARA
- Schedule 2 - threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
- Schedule 3 - special concern; may be reassessed for consideration for inclusion to Schedule 1

COSSARO
- NAR - Not at Risk
- SC - Special Concern
- THR - Threatened
- END - Endangered
- EXP - Extirpated
- DD - Data Deficient

Species Name		Conservation Rank					Source						
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	Local	NHIC [1]	iNaturalist [2]	DFO [3]	LIO [4]	Etobicoke Ceek Fish Data (TRCA)	Etobicoke Management Plan (TRCA)	Matrix Field Observations

1 Ontario Ministry of Natural Resources and Forestry (MNRF). 2024. Make a Map: Natural Heritage Areas. Mapping application. Accessed March 2024. https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html?viewer=Natural_Heritage.Natural_Heritage&locale=en-CA

2 iNaturalist. 2024. Observations. Accessed March 2024. https://www.inaturalist.org/observations

3 Fisheries and Oceans Canada (DFO). 2024. Aquatic Species at Risk Map. Accessed March 2024. https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

4 Ontario Ministry of Natural Resources and Forestry (MNRF). 2024. Ontario GeoHub. Open data resource through Land Information Ontario. Accessed March 2024. https://geohub.lio.gov.on.ca/

TABLE 4 Insect Species

Species Name		Conservation Rank				Source				
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC [1]	Ontario Butterfly Atlas [2]	iNaturalist [3]	Ontario Moth Atlas [4]	Matrix Field Observations
Coleoptera	**Beetles**									
Acalymma vittatum	Leaf Beetle	SNR						x		
Carabus granulatus	Ground Beetle	SNA						x		
Cicindela sexguttata	Tiger Beetle	S5						x		
Coccinella septempunctata	Seven-spotted Ladybird Beetle	SNA						x		
Coleomegilla maculata	Spotted Ladybird Beetle	S5						x		
Popillia japonica	Scarab Beetle	SNA						x		
Diptera	**Flies**									
Xenox tigrinus	Tiger Bee Fly	S3S4						x		
Philaenus spumarius	Meadow Spittlebug	SNA						x		
Hymenoptera	**Sawflies, Wasps, Bees, and Ants**									
Agapostemon sericeus	Whitish Sweat Bee	S5						x		
Andrena wilkella	European Legume Miner Bee	SNA						x		
Apis mellifera	European Honey Bee	SNA						x		
Bombus bimaculatus	Two-spotted Bumble Bee	S5						x		
Bombus griseocollis	Brown-belted Bumble Bee	S5						x		
Bombus impatiens	Common Eastern Bumble Bee	S5						x		
Megachile sculpturalis	Giant Leafcutter Bee	SNA						x		
Myrmica rubra	European Fire Ant	SNA						x		
Xylocopa virginica	Virginia Carpenter Bee	S4S5						x		
Lepidoptera	**Butterflies**									
Aglais milberti	Milbert's Tortoiseshell	S5					x			
Amphion floridensis	Nessus Sphinx	S4							x	
Anatrytone logan	Delaware Skipper	S4					x			
Ancyloxypha numitor	Least Skipper	S5					x			
Antheraea polyphemus	Polyphemus Moth	S5						x	x	
Apantesis nais	Nais Tiger Moth	SNR							x	
Atalopedes campestris	Sachem	SNA					x			
Atteva aurea	Ailanthus Webworm Moth	SNR						x		
Battus philenor	Pipevine Swallowtail	SNA					x			
Boloria bellona	Meadow Fritillary	S5					x			
Catocala cerogama	Yellow-banded Underwing	S5						x		
Catocala minuta	Little Underwing	SNR							x	
Catocala parta	Mother Underwing	S5							x	
Catocala piatrix	The Penitent	S4							x	
Celastrina lucia	Northern Spring Azure	S5					x			
Celastrina neglecta	Summer Azure	S5					x			
Ceratomia undulosa	Waved Sphinx Moth	S5							x	
Cercyonis pegala	Common Wood-Nymph	S5					x			
Chlosyne nycteis	Silvery Checkerspot	S5					x			
Cisseps fulvicollis	Yellow-collared Scape Moth	SNR							x	
Coenonympha tullia	Common Ringlet	S5					x			

Species Name		Conservation Rank				Source				
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC [1]	Ontario Butterfly Atlas [2]	iNaturalist [3]	Ontario Moth Atlas [4]	Matrix Field Observations
Colias eurytheme	Orange Sulphur	S5					x			
Colias philodice	Clouded Sulphur	S5					x	x		
Ctenucha virginica	Virginia Ctenucha Moth	S5							x	
Cupido comyntas	Eastern Tailed Blue	S5					x	x		
Danaus plexippus	Monarch	S2N,S4B	SC	END	SC		x	x		
Darapsa myron	Hog Sphinx	SU							x	
Datana integerrima	Walnut Caterpillar Moth	SNR							x	
Deidamia inscripta	Lettered Sphinx	SNA							x	
Epargyreus clarus	Silver-spotted Skipper	S4					x			
Erynnis baptisiae	Wild Indigo Duskywing	S4					x			
Erynnis juvenalis	Juvenal's Duskywing	S5					x			
Estigmene acrea	Salt Marsh Moth	S5							x	
Euchaetes egle	Milkweed Tussock Moth	S4?							x	
Eumorpha pandorus	Pandorus Sphinx	S4							x	
Euphyes dion	Dion Skipper	S4					x			
Euphyes vestris	Dun Skipper	S5					x			
Euptoieta claudia	Variegated Fritillary	SNA					x			
Feniseca tarquinius	Harvester	S4					x			
Glaucopsyche lygdamus	Silvery Blue	S5					x			
Halysidota tessellaris	Banded Tussock Moth	S5						x	x	
Haploa confusa	Confused Haploa	S5							x	
Hemaris diffinis	Snowberry Clearwing Moth	S4S5							x	
Hyalophora cecropia	Cecropia Moth	S5						x	x	
Hylephila phyleus	Fiery Skipper	SNA					x			
Junonia coenia	Common Buckeye	SNA					x			
Leptotes marina	Marine Blue	SNA					x			
Lethe anthedon	Northern Pearly-Eye	S5					x			
Lethe eurydice	Eyed Brown	S5					x			
Libytheana carinenta	American Snout	SNA					x			
Limenitis archippus	Viceroy	S5					x			
Limenitis arthemis arthemis	White Admiral	S5					x			
Limenitis arthemis astyanax	Red-spotted Purple	S5					x			
Lophocampa caryae	Hickory Tussock Moth	SNR						x	x	
Lophocampa maculata	Spotted Tussock Moth	S4							x	
Lymantria dispar	Gypsy Moth	SNA						x		
Malacosoma americana	Eastern Tent Caterpillar Moth	S5						x		
Megisto cymela	Little Wood-Satyr	S5					x			
Noctua pronuba	Large Yellow Underwing Moth	SNA						x		
Nymphalis antiopa	Mourning Cloak	S5					x	x		
Nymphalis l-album	Compton Tortoiseshell	S5					x			
Paonias excaecata	Blinded Sphinx	S5							x	
Papilio cresphontes	Giant Swallowtail	S4					x			
Papilio glaucus	Eastern Tiger Swallowtail	S5					x	x		

Species Name		Conservation Rank				Source				
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC [1]	Ontario Butterfly Atlas [2]	iNaturalist [3]	Ontario Moth Atlas [4]	Matrix Field Observations
Papilio polyxenes	Black Swallowtail	S5					x	x		
Peridroma saucia	Variegated Cutworm Moth	S5						x		
Phigalia titea	The Half-wing	SNR						x		
Phoebis sennae	Cloudless Sulphur	SNA					x			
Pholisora catullus	Common Sootywing	S4					x			
Phragmatobia fuliginosa	Ruby Tiger Moth	S4?							x	
Phyciodes cocyta	Northern Crescent	S5					x			
Phyciodes tharos	Pearl Crescent	S4					x	x		
Pieris oleracea	Mustard White	S4					x			
Pieris rapae	Cabbage White	SNA					x	x		
Pieris virginiensis	West Virginia White	S3	SC				x			
Poanes hobomok	Hobomok Skipper	S5					x			
Poanes viator	Broad-winged Skipper	S4					x			
Polites mystic	Long Dash Skipper	S5					x			
Polites origenes	Crossline Skipper	S4					x			
Polites peckius	Peck's Skipper	S5					x	x		
Polites themistocles	Tawny-edged Skipper	S5					x			
Polites vibex	Whirlabout	SNA					x			
Polygonia comma	Eastern Comma	S5					x			
Polygonia interrogationis	Question Mark	S5					x	x		
Polyommatus icarus	European Common Blue	SNA					x			
Pompeius verna	Little Glassywing	S4					x			
Pyralis farinalis	Meal Moth	SNR						x		
Pyrisitia lisa	Little Yellow	SNA					x			
Pyrrharctia isabella	Isabella Tiger Moth	S5						x	x	
Satyrium acadica	Acadian Hairstreak	S4					x			
Satyrium calanus	Banded Hairstreak	S4					x			
Satyrium caryaevorus	Hickory Hairstreak	S4					x			
Satyrium edwardsii	Edwards' Hairstreak	S4					x			
Satyrium liparops	Striped Hairstreak	S5					x			
Speyeria cybele	Great Spangled Fritillary	S5					x			
Sphecodina abbottii	Abbott's Sphinx	S4							x	
Spilosoma virginica	Virginian Tiger Moth	S5							x	
Thorybes pylades	Northern Cloudywing	S5					x			
Thymelicus lineola	European Skipper	SNA					x			
Tolype notialis	Small Tolype	SNR							x	
Tolype velleda	Large Tolype	SNR							x	
Vanessa atalanta	Red Admiral	S5					x	x		
Vanessa cardui	Painted Lady	S5					x			
Vanessa virginiensis	American Lady	S5					x			
Wallengrenia egeremet	Northern Broken-Dash	S5					x			
Zerene cesonia	Southern Dogface	SNA					x			
Mantodea	**Mantises**									

Species Name		Conservation Rank				Source				
Scientific Name	Common Name	Provincial (S-rank)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC [1]	Ontario Butterfly Atlas [2]	iNaturalist [3]	Ontario Moth Atlas [4]	Matrix Field Observations
Mantis religiosa	Praying Mantis	SNA						x		
Odonata	**Damselflies and Dragonflies**									
Calopteryx maculata	Ebony Jewelwing	S5						x		x
Ischnura verticalis	Eastern Forktail	S5						x		
Orthoptera	**Grasshoppers, Katydids, Crickets, and related insects**									
Dissosteira carolina	Carolina Grasshopper	S4S5						x		
Gryllus pennsylvanicus	Fall Field Cricket	S5						x		
Meconema thalassinum	Drumming Katydid	SNA						x		
Microcentrum rhombifolium	Greater Angle-wing Katydid	S4						x		
Total						**0**	**70**	**48**	**28**	**1**

Notes:

S-rank

S1 - Critically Imperiled
S2 - Imperiled
S3 - Vulnerable
S4 - Apparently Secure
S5 - Secure
SU - Unrankable
SNA - Unranked
SX - Presumed Extirpated
SH - Possibly Extirpated
S#? - Rank Uncertain

ESA

SC - Special Concern
THR - Threatened
END - Endangered
EXT - Extinct
EXP - Extirpated

Additional Notes

ESA - *Endangered Species Act*
COSEWIC - Committee on the Status of Endangered Wildlife in Canada
SARA - *Species at Risk Act*
NHIC - Natural Heritage Information Centre

COSEWIC

NAR - Not at Risk
SC - Special Concern
THR - Threatened
END - Endangered
EXT - Extinct
EXP - Extirpated
DD - Data Deficient

SARA Schedule

Schedule 1 - Officially protected under SARA
Schedule 2 - threatened/endangered; may be reassessed for consideration for inclusion to Schedule 1
Schedule 3 - special concern; may be reassessed for consideration for inclusion to Schedule 1

COSSARO

NAR - Not at Risk
SC - Special Concern
THR - Threatened
END - Endangered
EXP - Extirpated
DD - Data Deficient

Sources:

1 Ontario Ministry of Natural Resources and Forestry (MNRF). 2024. Make a Map: Natural Heritage Areas. Mapping application. Accessed March 2024. https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html?viewer=Natural_Heritage.Natural_Heritage&locale=en-CA

2 Toronto Entomologists' Association (TEA). 2024. Ontario Butterfly Atlas. Accessed March 2024. https://www.ontarioinsects.org/atlas/

3 iNaturalist (iNaturalist). 2024. Observations. Accessed March 2024. https://www.inaturalist.org/observations

4 Toronto Entomologists' Association (TEA). 2024. Ontario Butterfly Atlas. Accessed March 2024. https://www.ontarioinsects.org/moth/index.html

TABLE 5 Mollusc Species

Species		Conservation Rank				Source			
Scientific Name	Common Name	Provincial (S-RANK)	Provincial (ESA)	National (COSEWIC)	National (SARA)	NHIC (1)	iNaturalist (2)	DFO (3)	Matrix Field Observations
Unionidae									
Amblema plicata	Three-ridge	S4					x		
Arionidae									
Arion subfuscus	Dusky Arion Slug	SNA					x		
Helicidae									
Cepaea nemoralis	Grovesnail	SNA					x		
TOTAL:						**0**	**3**	**0**	**0**

Sources:

1 Ontario Ministry of Natural Resources and Forestry (MNRF). 2024. Make a Map: Natural Heritage Areas. Mapping application. Accessed March 2024. https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html?viewer=Natural_Heritage.Na

2 iNaturalist. 2024. Observations. Accessed March 2024. https://www.inaturalist.org/observations

3 Fisheries and Oceans Canada (DFO). 2024. Aquatic Species at Risk Map. Accessed March 2024. https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

Table 6 Mammal Species

Species Name		Conservation Ranking				Source				
Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC (1)	Ontario Mammals (2)	iNaturalist (3)	MECP Information Request (2021)	Matrix Field Observations
Artiodactyla	**Deer and Bison**									
Odocoileus virginianus	White-tailed Deer	S5					x			
Carnivora	**Carnivores**									
Canis latrans	Coyote	S5					x	x		x
Lontra canadensis	North American River Otter	S5					x			
Lynx rufus	Bobcat	S4					x			
Martes americana	American Marten	S5					x			
Mephitis mephitis	Striped Skunk	S5					x	x		
Mustela frenata	Long-tailed Weasel	SU					x			
Mustela nivalis	Least Weasel	SU					x			
Neogale vison	American Mink	S4					x			
Procyon lotor	Northern Raccoon	S5					x	x		x
Ursus americanus	American Black Bear	S5					x			
Vulpes vulpes	Red Fox	S5					x	x		
Chiroptera	**Bats**									
Eptesicus fuscus	Big Brown Bat	S4					x	x		
Lasionycteris noctivagans	Silver-haired Bat	S4					x			
Lasiurus borealis	Red Bat	S4					x			
Lasiurus cinereus	Hoary Bat	S4					x			
Myotis leibii	Eastern Small-footed Myotis	S2S3	END				x		x	
Myotis lucifugus	Little Brown Myotis	S3	END	END	END		x		x	
Myotis septentrionalis	Northern Myotis	S3	END	END	END		x		x	
Perimyotis subflavus	Tricolored Bat	S3?	END	END	END		x			
Didelphimorphia	**Oppossums**									
Didelphis virginiana	Virginia Opossum	S4					x	x		
Lagomorphia	**Rabbits and Hares**									
Sylvilagus floridanus	Eastern Cottontail	S5					x	x		
Lepus americanus	Snowshoe Hare	S5					x			
Rodentia	**Rodents**									
Castor canadensis	Beaver	S5					x	x		
Erethizon dorsatum	Porcupine	S5					x			
Glaucomys sabrinus	Northern Flying Squirrel	S5					x			
Glaucomys volans	Southern Flying Squirrel	S4					x			
Marmota monax	Woodchuck	S5					x			
Microtus pennsylvanicus	Meadow Vole	S5					x			
Mus musculus	House Mouse	SNA					x			
Myodes gapperi	Southern Red-backed Vole	S5					x			
Napaeozapus insignis	Woodland Jumping Mouse	S5					x			
Ondatra zibethicus	Muskrat	S5					x			

Scientific Name	Common Name	S-RANK	ESA	COSEWIC	SARA	NHIC (1)	Ontario Mammals (2)	iNaturalist (3)	MECP Information Request (2021)	Matrix Field Observations
Peromyscus leucopus	White-footed Mouse	S5					x			
Peromyscus maniculatus	Deer Mouse	S5					x			
Rattus norvegicus	Norway Rat	SNA					x			
Sciurus carolinensis	Grey Squirrel	S5					x	x		x
Synaptomys cooperi	Southern Bog Lemming	S4					x			
Tamias striatus	Eastern Chipmunk	S5					x			
Tamiasciurus hudsonicus	Red Squirrel	S5					x			
Zapus hudsonius	Meadow Jumping Mouse	S5					x			
Soricomorpha										
Blarina brevicauda	Northern Short-tailed Shrew	S5					x			
Condylura cristata	Star-nosed Mole	S5					x			
Parascalops breweri	Hairy-tailed Mole	S4					x			
Sorex cinereus	Masked Shrew	S5					x			
Sorex hoyi	Pygmy Shrew	S4					x			
TOTAL:						**0**	**46**	**9**	**3**	**3**

Sources:

1 Ontario Ministry of Natural Resources and Forestry (MNRF). 2024. Make a Map: Natural Heritage Areas. Mapping application. Accessed March 2024. https://www.lioapplications.lrc.gov.on.ca/Natural_Heritage/index.html?viewer=Natura

2 iNaturalist. 2024. Ontario Mammals. Accessed March 2024. https://www.inaturalist.org/guides/1327?view=card

3 iNaturalist. 2024. Observations. Accessed March 2024. https://www.inaturalist.org/observations

COMMON NAME	BOTANICAL NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	INVASIVE SPECIES ONTARIO	PROVINCIAL RANK	ESA STATUS	COSEWIC STATUS (2016-08-19)	SARA STATUS (2016-08-19)	GLOBAL RANK	REGIONAL STATUS 7E - CAROLINIAN ZONE - 2017	LOCAL STATUS CVC and PEEL	All Species	TRCA Data Request	iNaturalist	MECP Information Request (2021)	NHIC	STUDY AREA MATRIX FIELD OBSERVATIONS
	Reference										Oldham 2017	Credit Valley Conservation, 2002						
FERNS & ALLIES	**PTERIDOPHYTES**												x	o	o	o		x
Wood Fern Family	**Dryopteridaceae**												x	o	o			x
Ostrich Fern	*Matteuccia struthiopteris*	5	0			S5				G5	C		x		x			
Horsetail Family	**Equisetaceae**												x	o	o			x
Field Horsetail	*Equisetum arvense*	0	0			S5				G5	C		x		x			
CONIFERS	**GYMNOSPERMS**												x	o	o			
Cedar Family	**Cupressaceae**												x	o	o			
Eastern White Cedar	*Thuja occidentalis*	4	-3			S5				G5	C		x	x				x
Pine Family	**Pinaceae**												x	o	o			x
Balsam Fir	*Abies balsamea*	5	-3			S5				G5	R		x					x
White Spruce	*Picea glauca*	6	3			S5				G5	U		x	x	x			x
Red Pine	*Pinus resinosa*	8	3			S5				G5	R	R	x	x				x
Eastern White Pine	*Pinus strobus*	4	3			S5				G5	C		x	x				x
Eastern Hemlock	*Tsuga canadensis*	7	3			S5				G5	C		x	x	x			x
DICOTS	**DICOTYLEDONS**												x	o	o	o		
Maple Family	**Aceraceae**												x		o			x
Hedge Maple	*Acer campestre*		5			SNA				GNR	IR		x		x			
Amur Maple	*Acer ginnala*		5	-2	4	SNA				G--TNR			x					x
Manitoba Maple	*Acer negundo*	0	0		1	S5				G5	C		x		x			x
Norway Maple	*Acer platanoides*		5	-3	2	SNA				GNR	IU		x					x
Silver Maple	*Acer saccharinum*	5	-3			S5				G5	C		x					x
Tatarian Maple	*Acer tataricum*										IR		x					x
Sumac or Cashew Family	**Anacardiaceae**												x		o			x
Staghorn Sumac	*Rhus typhina*	1	3			S5				G5	C		x		x			x
Carrot or Parsley Family	**Apiaceae**												x	o	o			x
Canadian Honewort	*Cryptotaenia canadensis*	5	0			S5				G5	C		x		x			
Wild Carrot	*Daucus carota*		5	-2		SNA				GNR	IC		x		x			x
Wild Parsnip	*Pastinaca sativa*		5	-3		SNA				GNR	IU		x		x			x
Dogbane Family	**Apocynaceae**												x		o			x
Common Periwinkle	*Vinca minor*		5	-2	2	SNA				GNR	IX		x		x			x
Ginseng Family	**Araliaceae**												x		o			x
English Ivy	*Hedera helix*					SNA					IR		x		x			
Milkweed Family	**Asclepiadaceae**												x		o			x
Common Milkweed	*Asclepias syriaca*	0	5			S5				G5	C		x		x			x
European Swallow-wort	*Vincetoxicum rossicum*		5	-3	1	SNA				GNR	IX		x		x			x
Composite or Aster Family	**Asteraceae**												x	o	o	o		x
Common Yarrow	*Achillea millefolium*		3	-1		SNA				G5	IX		x		x			
Common Ragweed	*Ambrosia artemisiifolia*	0	3			S5				G5	C		x		x			
Giant Ragweed	*Ambrosia trifida*	0	0			S5				G5	C		x		x			
Great Burdock	*Arctium lappa*		3			SNA				GNR	IU		x		x			
Common Burdock	*Arctium minus*		3	-2		SNA				GNR	IC		x					x
Common Wormwood	*Artemisia absinthium*		5	-1	3	SNA				GNR	IR		x		x			
Heart-leaved Aster	*Symphyotrichum cordifolium*	5	5			S5				G5	C		x		x			
Panicled Aster	*Symphyotrichum lanceolatum*	3	-3			S5				G5	C		x					x
Calico Aster	*Symphyotrichum lateriflorum*	3	0			S5				G5	C		x					x
New England Aster	*Symphyotrichum novae-angliae*	2	-3			S5				G5	C		x					x
Chicory	*Cichorium intybus*		5	-1		SNA				GNR	IC		x		x			x

COMMON NAME	BOTANICAL NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	INVASIVE SPECIES ONTARIO	PROVINCIAL RANK	ESA STATUS	COSEWIC STATUS (2016-08-19)	SARA STATUS (2016-08-19)	GLOBAL RANK	REGIONAL STATUS 7E - CAROLINIAN ZONE - 2017	LOCAL STATUS CVC and PEEL	All Species	TRCA Data Request	iNaturalist	MECP Information Request (2021)	NHIC	STUDY AREA MATRIX FIELD OBSERVATIONS
Canada Thistle	*Cirsium arvense*		3	-1	1	SNA				G5	IC		x		x			x
Bull Thistle	*Cirsium vulgare*		3	-1		SNA				GNR	IC		x		x			
Philadelphia Fleabane	*Erigeron philadelphicus*	1	-3			S5				G5	C		x		x			x
Tall Boneset	*Eupatorium altissimum*	3	5			S4				G5	R		x		x			
White Snakeroot	*Ageratina altissima*					S5				G5	C		x		x			
Common Sunflower	*Helianthus annuus*		3	-1		SNA				G5	IR		x		x			
Nipplewort	*Lapsana communis*		3	-2	4	SNA				GNR	IX		x		x			x
Black-eyed Susan	*Rudbeckia hirta*	0	3			S5				G5	C		x					x
Brown-eyed Susan	*Rudbeckia triloba*		3	-1		SNA				G5	IX		x		x			
Tall Goldenrod	*Solidago altissima*	1	3			S5				G5	C		x					x
Canada Goldenrod	*Solidago canadensis var. canadensis*	1	3			S5				G5	C		x					x
Canada Goldenrod	*Solidago canadensis var. hargeri*										U		x					x
Zig-zag Goldenrod	*Solidago flexicaulis*	6	3			S5				G5	C		x		x			x
Canada Goldenrod	*Solidago lepida*	1	3			S4?				G5			x					x
Common Sow-thistle	*Sonchus oleraceus*		3	-1		SNA				GNR	IX		x		x			
Common Tansy	*Tanacetum vulgare*		5	-1		SNA				GNR	IX		x		x			x
Common Dandelion	*Taraxacum officinale*		3	-2		SNA				G5	IC		x		x			x
Jack go to bed at noon	*Tragopogon pratensis*		5	-1		SNA				GNR	IX		x		x			
Coltsfoot	*Tussilago farfara*		3	-2		SNA				GNR	IC		x		x			
Rough Cocklebur	*Xanthium strumarium*	2	0			S5				G5	C		x		x			
Touch-me-not Family	**Balsaminaceae**												X		o			x
Jewelweed	*Impatiens capensis*	4	-3			S5				G5	C		x					x
Pale Touch-me-not	*Impatiens pallida*	7	-3			S4				G5	C	R	x		x			
Barberry Family	**Berberidaceae**												X	o	o			x
May-apple	*Podophyllum peltatum*	5	3			S5				G5	C		x		x			
Birch Family	**Betulaceae**												X	o	o			x
Paper Birch	*Betula papyrifera*	2	2			S5				G5	C		x	x				x
Blue Beech	*Carpinus caroliniana*										C		x					x
Blue Beech	*Carpinus caroliniana ssp. virginiana*	6	0			S5				G5T5			x					x
Bignonia Family	**Bignoniaceae**												X		o			x
Northern Catalpa	*Catalpa speciosa*		3	-1		SNA				G4?	IR		x		x			
Borage Family	**Boraginaceae**												X		o			x
Hound's-tongue	*Cynoglossum officinale*		5	-1		SNA				GNR	IU		x		x			
Viper's Bugloss	*Echium vulgare*		5	-2		SNA				GNR	IC		x		x			
Virginia Stickweed	*Hackelia virginiana*	5	1			S5				G5	C		x					x
Field Forget-me-not	*Myosotis arvensis*		0	-1		SNA				GNR	IR		x					x
True Forget-me-not	*Myosotis scorpioides*		-5	-1	4	SNA				G5	IX		x		x			
Strict Forget-me-not	*Myosotis stricta*		5	-1		SNA				GNR	IX		x		x			
Woodland Forget-me-not	*Myosotis sylvatica*		5	-1		SNA				G5	IR		x		x			
Lungwort	*Pulmonaria officinalis*					SNA				GNR	IR		x		x			
Mustard Family	**Brassicaceae**												X	o	o	o		x
Garlic Mustard	*Alliaria petiolata*		0	-3	1	SNA				GNR	IC		x		x			x
Garden Yellowrocket	*Barbarea vulgaris*		0	-1	3	SNA				GNR	IC		x					x
Cut-leaved Toothwort	*Cardamine concatenata*	6	3			S5				G5	C		x		x			
Narrowleaf Bitter-cress	*Cardamine impatiens*		5	-1		SNA				GNR	IR		x		x			x
Dame's Rocket	*Hesperis matronalis*		5	-3	1	SNA				G4G5	IC		x		x			x
Annual Honesty	*Lunaria annua*		5	-1		SNA				GNR	IR		x		x			
Field Penny-cress	*Thlaspi arvense*		5	-1		SNA				GNR	IC		x		x			
Bellflower Family	**Lobelia**												X		o			x
Creeping Bellflower	*Campanula rapunculoides*		5	-2	4	SNA				GNR	IU		x					x
Honeysuckle Family	**Caprifoliaceae**												X	o	o	o		x
Tartarian Honeysuckle	*Lonicera tatarica*		3	-3	1	SNA				GNR	IC		x					x
Western Snowberry	*Symphoricarpos occidentalis*		5	-1		SNA				G5	IR		x					x
European Cranberrybush	*Viburnum opulus*		0	-1		SNA				G5			x		x			
Pink Family	**Caryophyllaceae**												X	o	o	o		x
Bladder Campion	*Silene latifolia*		5	-2		SNA				GNR	IX		x		x			
Goosefoot Family	**Chenopodiaceae**												X	o	o	o		x
Lamb's Quarters	*Chenopodium album*					SNA				G5	IC		x		x			
Morning-glory Family	**Convolvulaceae**												X		o			x
Field Bindweed	*Convolvulus arvensis*		5	-1	3	SNA				GNR	IC		x					x
Dogwood Family	**Cornaceae**												X		o			x
Alternate-leaved Dogwood	*Cornus alternifolia*	6	5			S5				G5	C		x					x

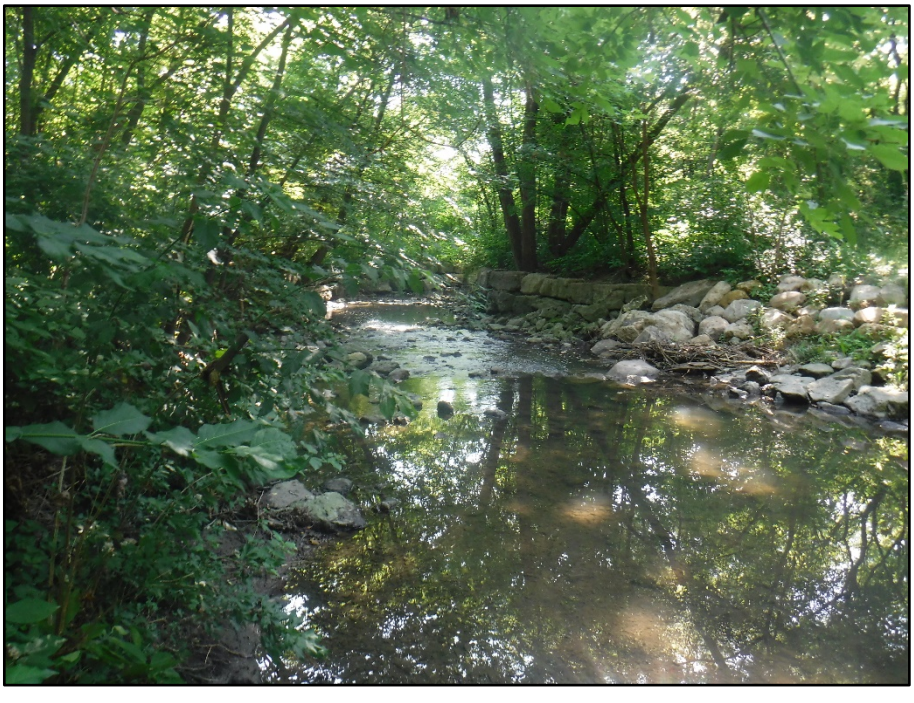
COMMON NAME	BOTANICAL NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	INVASIVE SPECIES ONTARIO	PROVINCIAL RANK	ESA STATUS	COSEWIC STATUS (2016-08-19)	SARA STATUS (2016-08-19)	GLOBAL RANK	REGIONAL STATUS 7E - CAROLINIAN ZONE - 2017	LOCAL STATUS CVC and PEEL	All Species	TRCA Data Request	iNaturalist	MECP Information Request (2021)	NHIC	STUDY AREA MATRIX FIELD OBSERVATIONS
Gray Dogwood	*Cornus racemosa*	2	-2			S5				G5	C		x					x
Red-osier Dogwood	*Cornus sericea*	2	-3			S5				G5	C		x		x			
Stonecrop Family	**Crassulaceae**												x		o			x
Goldmoss Stonecrop	*Sedum acre*		5	-3	2	SNA				GNR	IX		x		x			
Gourd Family	**Cucurbitaceae**												x		o			
Wild Cucumber	*Echinocystis lobata*	3	-2			S5				G5	C		x		x			
Teasel Family	**Dipsacaceae**												x		o			
Fuller's Teasel	*Dipsacus fullonum*		5	-1	3	SNA				GNR	IC		x		x			
Spurge Family	**Euphorbiaceae**												x	o	o	o		x
Three-seeded Mercury	*Acalypha rhomboidea*	0	3			S5				G5	C		x		x			
Spotted Spurge	*Euphorbia maculata*		4	-1		SNA				G5?	IC		x		x			
Pea Family	**Fabaceae**												x	o	o	o		x
Crown-vetch	*Securigera varia*		5	-2	1	SNA				GNR	IX		x		x			
Honey Locust	*Gleditsia triacanthos*	3	0			S2?				G5	R		x					x
Bird's-foot Trefoil	*Lotus corniculatus*		1	-2	2	SNA				GNR	IC		x		x			x
Black Medick	*Medicago lupulina*		1	-1	4	SNA				GNR	IC		x					x
White Sweet-clover	*Melilotus albus*		3	-3	2	SNA				G5	IC		x					x
Black Locust	*Robinia pseudoacacia*		4	-3	2	SNA				G5	IC		x		x			
Red Clover	*Trifolium pratense*		2	-2	4	SNA				GNR	IC		x		x			
White Clover	*Trifolium repens*		2	-1	4	SNA				GNR	IC		x		x			
Cow Vetch	*Vicia cracca*		5	-1	2	SNA				GNR	IX		x		x			x
Beech Family	**Fagaceae**												x	o	o	o		x
Bur Oak	*Quercus macrocarpa*	5	1			S5				G5	C		x					x
Red Oak	*Quercus rubra*	6	3			S5				G5	C		x	x				x
Geranium Family	**Geraniaceae**												x	o	o	o		x
Spotted Geranium	*Geranium maculatum*	6	3			S5				G5	C		x		x			
Herb-robert	*Geranium robertianum*		5	-2		S5				G5	C		x		x			x
Water-leaf Family	**Hydrophyllaceae**												x	o	o	o		x
Virginia Water-leaf	*Hydrophyllum virginianum*	6	-2			S5				G5	C		x		x			
Walnut Family	**Juglandaceae**												x	o	o	o		x
Butternut	*Juglans cinerea*	6	2			S2?	END	END	END	G4	U		x	x	x	x		x
Black Walnut	*Juglans nigra*	5	3			S4?				G5	C		x		x			x
Mint Family	**Lamiaceae**												x	o	o			x
Common Bugle	*Ajuga reptans*		5	-1	4	SNA				GNR	IR		x		x			
Ground Ivy	*Glechoma hederacea*		5	-2	4	SNA				GNR	IC		x		x			x
Purple Dead-nettle	*Lamium purpureum*		5	-2		SNA				GNR	IR		x		x			
Common Motherwort	*Leonurus cardiaca*										IC		x		x			x
Common Motherwort	*Leonurus cardiaca ssp. cardiaca*		5	-2		SNA				GNRTNR			x					x
Catnip	*Nepeta cataria*		1	-2	4	SNA				GNR	IC		x					x
Loosestrife Family	**Lythraceae**												x	o	o			x
Purple Loosestrife	*Lythrum salicaria*		-5	-3	1	SNA				G5	IC		x		x			
Moonseed Family	**Menispermaceae**												x	o				
Common Moonseed	*Menispermum canadense*	7	0			S4				G5	C	R	x	x				
Mulberry Family	**Moraceae**												x		o			x
White Mulberry	*Morus alba*		0	-3	1	SNA				GNR	IC		x		x			x
Olive Family	**Oleaceae**												x		o			x
White Ash	*Fraxinus americana*	4	3			S4				G5	C		x					x
Green Ash	*Fraxinus pennsylvanica*	3	-3			S4				G5	C		x					x
Common Lilac	*Syringa vulgaris*		5	-2	2	SNA				GNR	IX		x		x			x
Wood Sorrel Family	**Oxalidaceae**												x		o			x
Creeping Wood-sorrel	*Oxalis corniculata*		3	-1		SNA				GNR	IR		x		x			
Common Yellow Oxalis	*Oxalis stricta*	0	3			S5				G5	C		x					x
Poppy Family	**Papaveraceae**												x		o			x
Celandine	*Chelidonium majus*		5	-3		SNA				GNR	IU		x		x			
Bloodroot	*Sanguinaria canadensis*	5	4			S5				G5	C		x		x			x
Plantain Family	**Plantaginaceae**												x		o			x
Common Plantain	*Plantago major*		-1	-1		SNA				G5	IC		x					x
Smartweed Family	**Polygonaceae**												x	o	o			x
Hedge Bindweed	*Fallopia dumetorum*										IH		x					x
Japanese Knotweed	*Fallopia japonica*		3	-1	2	SNA				G?	IX		x					x
Japanese Knotweed	*Fallopia japonica var. japonica*										IX		x					x
Primrose Family	**Primulaceae**												x	o	o			x
Fringed Loosestrife	*Lysimachia ciliata*	4	-3			S5				G5	C		x		x			x
Creeping Jenny	*Lysimachia nummularia*		-4	-3	2	SNA				GNR	IC		x					x
Buttercup Family	**Ranunculaceae**												x	o	o			x
Tall Buttercup	*Ranunculus acris*		-2	-2		SNA				G5	IC		x					x
Buckthorn Family	**Rhamnaceae**												x	o	o			x
Common Buckthorn	*Rhamnus cathartica*		3	-3	1	SNA				GNR	IC		x		x			x
Rose Family	**Rosaceae**												x	o	o			x
Smooth Serviceberry	*Amelanchier laevis*	5	5			S5				G5	C		x	x				
Hawthorn species	*Crataegus sp.*	4	5										x					x
Woodland Strawberry	*Fragaria vesca*										U		x	x				x
Wild Strawberry	*Fragaria virginiana*	2	1			S5				G5	C		x					x
White Avens	*Geum canadense*	3	0			S5				G5	C		x					x
Wood Avens	*Geum urbanum*		5	-1		SNA				G5	IX		x		x			x
Siberian Crabapple	*Malus baccata*					SNA				GNR	IR		x					x
Ninebark	*Physocarpus opulifolius*	5	-2			S5				G5	U	R	x	x				

COMMON NAME	BOTANICAL NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	INVASIVE SPECIES ONTARIO	PROVINCIAL RANK	ESA STATUS	COSEWIC STATUS (2016-08-19)	SARA STATUS (2016-08-19)	GLOBAL RANK	REGIONAL STATUS 7E - CAROLINIAN ZONE - 2017	LOCAL STATUS CVC and PEEL	All Species	TRCA Data Request	iNaturalist	MECP Information Request (2021)	NHIC	STUDY AREA MATRIX FIELD OBSERVATIONS
Rough-fruited Cinquefoil	*Potentilla recta*		5	-2		SNA				GNR	IC		x					x
Canada Plum	*Prunus nigra*	4	4			S4				G4G5	U		x		x			
Pin Cherry	*Prunus pensylvanica*	3	4			S5				G5	C		x	x				x
Black Cherry	*Prunus serotina*	3	3			S5				G5	C		x					x
Nanking Cherry	*Prunus tomentosa*		5	-1		SNA				GNR	IR		x		x			
Choke Cherry	*Prunus virginiana*	2	1			S5				G5	C		x					x
Dog Rose	*Rosa canina*		5	-1		SNA				GNR	IX		x		x			
Multiflora Rose	*Rosa multiflora*		3	-3	1	SNA				GNR	IC		x		x			
American Red Raspberry	*Rubus idaeus*	0	-2			SNA				G5			x					x
Purple Flowering Raspberry	*Rubus odoratus*	3	5			S5				G5	C		x		x			
European Mountain-ash	*Sorbus aucuparia*		5	-2	4	SNA				G5	IX		x					x
Madder Family	**Rubiaceae**												x	o	o			x
Cleavers	*Galium aparine*	4	3			S5				G5	C	R	x					x
Willow Family	**Salicaceae**												x	o	o			x
Eastern Cottonwood	*Populus deltoides*										C		x					x
Eastern Cottonwood	*Populus deltoides ssp. deltoides*	4	-1			S5				G5T5	C		x					x
Trembling Aspen	*Populus tremuloides*	2	0			S5				G5	C		x		x			
Crack Willow	*Salix fragilis*		-1	-3	3	SE				GNR	IC		x					x
Saxifrage Family	**Saxifragaceae**												x	o	o			x
Ditch Stonecrop	*Penthorum sedoides*	4	-5			S5				G5	C		x		x			
Figwort Family	**Scrophulariaceae**												x	o	o			x
Butter-and-eggs	*Linaria vulgaris*		5	-1	4	SNA				GNR	IC		x		x			x
Common Mullein	*Verbascum thapsus*		5	-2		SNA				GNR	IC		x		x			
Gray Field Speedwell	*Veronica polita*		5	-1		SNA				GNR	IX		x		x			
Thyme-leaved Speedwell	*Veronica serpyllifolia*	0	-3			SNA?				G5	IC		x		x			
Nightshade Family	**Solanaceae**												x	o	o			x
Bittersweet Nightshade	*Solanum dulcamara*		0	-2	3	SNA				GNR	IC		x		x			x
Linden Family	**Tiliaceae**												x	o	o			x
American Basswood	*Tilia americana*	4	3			S5				G5	C		x					x
Little Leaf Linden	*Tilia cordata*				4	SNA				GNR	IR		x		x			
Elm Family	**Ulmaceae**												x	o	o			x
American Elm	*Ulmus americana*	3	-2			S5				G5	C		x					x
Siberian Elm	*Ulmus pumila*		5	-1	2	SNA				GNR	IX		x					x
Slippery Elm	*Ulmus rubra*	6	0			S5				G5	C		x	x				x
Nettle Family	**Urticaceae**												x		o			x
Stinging Nettle	*Urtica dioica ssp. dioica*		-1	-1	3	SNA				G5T5?	IR		x					x
Vervain Family	**Verbenaceae**												x		o			x
Blue Vervain	*Verbena hastata*	4	-4			S5				G5	C		x					x
Violet Family	**Violaceae**												x	o	o			x
Sweet Violet	*Viola odorata*		5	-1	4	SNA				GNR	IR		x		x			x
Woolly Blue Violet	*Viola sororia*	4	1			S5				G5	C		x		x			x
Grape Family	**Vitaceae**												x		o			x
Virginia Creeper	*Parthenocissus quinquefolia*	6	1			S4?				G5	U		x					x
Riverbank Grape	*Vitis riparia*	0	-2			S5				G5	C		x		x			x
MONOCOTS	**MONOCOTYLEDONS**												x	o	o			
Arum Family	**Araceae**												x	o	o			x
Jack-in-the-pulpit	*Arisaema triphyllum*	5	-2			S5				G5	C		x		x			
Skunk Cabbage	*Symplocarpus foetidus*	7	-5			S5				G5	C	R	x		x			
Lily Family	**Liliaceae**												x	o	o			x
European Lily-of-the-valley	*Convallaria majalis*		5	-2	3	SNA				G5	IX		x		x			
Yellow Trout-lily	*Erythronium americanum*	5	5			S5				G5	C		x		x			
Snowdrop	*Galanthus nivalis*					SNA				GNR	IR		x		x			
Canada Mayflower	*Maianthemum canadense*	5	0			S5				G5	C		x	x				
Large False Solomon's Seal	*Maianthemum racemosum*	4	3			S5				G5	C		x		x			x
Starry False Solomon's Seal	*Maianthemum stellatum*	6	1			S5				G5	C		x		x			
Common Grape Hyacinth	*Muscari botryoides*		5	-1		SNA				GNR	IR		x		x			
Daffodil	*Narcissus pseudonarcissus*					SNA				GNR	IR		x					x
Sleepydick	*Ornithogalum umbellatum*		1	-1		SNA				G3G5	IR		x		x			
Siberian Squill	*Scilla siberica*		5	-1	2	SNA				GNR	IR		x		x			x
Grass Family	**Poaceae**												x	o	o			x
Smooth Brome	*Bromus inermis*		5	-3	4	SNA				G5TNR	IC		x					x
Poverty Oat Grass	*Danthonia spicata*	5	5			S5				G5	C		x	x				
Foxtail Grass	*Hordeum jubatum*					SNA				G5T5	IU		x		x			
Reed Canary Grass	*Phalaris arundinacea*	0	-4			S5				G5	C		x					x
Timothy	*Phleum pratense*		3	-1		SNA				GNR	IC		x					x
Canada Blue Grass	*Poa compressa*	0	2			SNA				GNR	IC		x					x

APPENDIX B
Site Photographs

Matrix Supplied
May 24, 2019

1. Most upstream extent of the study area approximately 500m upstream of Dixie Road



Matrix Supplied
July 10, 2019

2. Channel armoring changes from large boulders to armour stone along the banks.

Matrix Supplied
May 24, 2019

3. Riparian forest community along the north side of the channel upstream of Dixie Road.

Matrix Supplied
May 24, 2019

4. Riparian forest community along the south side of the channel upstream of Dixie Road

Matrix Supplied
July 10, 2019

5. The channel continues to be heavily armoured moving downstream towards Dixie Road.

Matrix Supplied
July 10, 2019

6. There is spare amounts of fish habitat present which consists of overhanging vegetation, and some larger cobbles and boulders.

Matrix Supplied
May 24, 2019

7. Little Etobicoke Creek downstream of Dixie Road

Matrix Supplied
May 24, 2019

8. Riparian habitat north of the channel and downstream of Dixie Road.

Matrix Supplied
July 10, 2019

9. Channel continues to be heavily armoured downstream of Dixie Road with overhanging vegetation.

Matrix Supplied
July 10, 2019

10. Channel has larger areas of deposition directly downstream of Dixie Road which has created areas of concentrated flows.

Matrix Supplied
August 22, 2019

11. Overhanging vegetation and fallen trees over the channel

Matrix Supplied
August 22, 2019

12. Armourstone ends approximately 500m upstream of Dixie Road.

Matrix Supplied
August 22, 2019

13. Exposed banks are undercut providing cover for fish.

Matrix Supplied
August 22, 2019

14. Channel has larger areas of deposition directly downstream of Dixie Road which has created areas of concentrated flows.

Matrix Supplied
August 22, 2019

15. Butternut tree within the Study Area.

Matrix Supplied
August 22, 2019

16. Woody debris within the Channel.

Matrix Supplied
August 22, 2019

17. Channel widens at confluence with small trib.

Matrix Supplied
August 22, 2019

18. Channel banks are armoured at meander bend. Large boulders within channel with overhanging vegetation.

Matrix Supplied
August 22, 2019

19. Gabion baskets create a slow flowing pooled habitat with overhanging vegetation.

Matrix Supplied
August 22, 2019

20. Channel narrows moving downstream towards Dundas.

Matrix Supplied
July 30, 2021

21. A representative photo of a riffle downstream of Dundas St E.

Matrix Supplied
July 30, 2021

22. A representative photo of a pool downstream of Dundas St E.

APPENDIX C
Species at Risk and Species of Conservation Concern Screening

TABLE 1 Species At Risk

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Probability of Occurrence within Study Area	Conclusions/ Recommendations
Avian	Bank Swallow *Riparia riparia*	THR	THR Schedule 1	THR	- Requires vertical faces in sand or silt deposits; river and lake banks, active/inactive sand and gravel pits, road cuts, soil stockpiles. - Breeding sites are located close to aerial foraging areas such as grasslands, meadows, pastures, and cropland. - Large wetlands used for nocturnal roost sites during post-breeding, migration and wintering periods.	- Common across southern Ontario, especially along Lake Erie and Lake Ontario shorelines and the Saugeen River. - Sparse populations scattered across northern Ontario.	OBBA, MECP Info Request	Moderate - potential suitable vertical river banks present within study area. This species was not observed during field investigations.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Avian	Bobolink *Dolichonyx oryzivorus*	THR	THR Schedule 1	SC	- Hayfields, pastures, wet prairie, graminoid peatlands, abandoned farm fields dominated by tall grasses, no-till cropland, small-grain fields, restored surface mining sites. - Small nests are often built on the ground in dense grasses. - Typically not abundant in short-grass prairie, alfalfa, or in row crop monocultures (corn, soybean, wheat). **- TPO, TPS, CUM1**.	- Southern Ontario north to James Bay.	OBBA	Low - the study area lacks suitable grassland habitat for this species	Nothing further
Avian	Chimney Swift *Chaetura pelagica*	THR	THR Schedule 1	THR	- Historically included hollow trees. - More commonly found in and around urban settlements, including chimneys and other manmade structures. - Typically close to water. **- TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1 adjacent to suitable nesting habitat**.	- Southern Ontario north to Timmins.	NHIC, OBBA, eBird, MECP Info Request, TRCA Data Request, Matrix Field Observation	Confirmed - this species was observed flying over the study area. There are no candidate chimneys for nesting within the study area. It is anticipated that the birds use the study area for foraging.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Avian	Eastern Meadowlark *Sturnella magna*	THR	THR Schedule 1	THR	- Moderately tall grasslands; prairies, savannahs, pastures and hayfields, alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, overgrown fields. - Small trees, shrubs, or fence posts used as elevated song perches. **- TPO, TPS, CUM1, CUS, and MAM2**.	- Southern Ontario north to Timmins, as well as Lake of the Woods area.	OBBA	Low - the study area lacks suitable grassland habitat for this species	Nothing further
Avian	Eastern Whip-poor-will *Antrostomus vociferus*	THR	THR Schedule 1	SC	- Typically a mix of open and forested areas; savannahs, open woodlands, or openings in mature deciduous, coniferous and mixed forests (commonly pine and oak forests). - Foraging habitat may include shrubby pastures or wetlands with perches. **- TPS, TPW, CUW, FOD, FOC and FOM where open areas are present**.	- Southern Ontario to north side of Lake Superior.	NHIC	Moderate - potential suitable forested and open habitat is present within the study area. This species was not observed during field investigations.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Avian	Golden Eagle *Aquila chrysaetos*	END	No Status	No Status	- Nest in remote, undisturbed areas, usually building their nests on ledges on a steep cliff or riverbank, but they will also use large trees if needed. - Most hunting is done near open areas such as large bogs or tundra. During migration they could be encountered anywhere, but are most frequently seen migrating west along the shores of Lake Ontario and Erie in November.	- There are only 6 extant populations within Ontario. These are located within Northern Ontario: Fort Severn, Peawanuck, Little Shagmau River, Shagmu River, Shamattawa River, Sutton Narrows, Wachi Creek, and Winisk River. - In Ontario, breeding Golden Eagles are presently known only from the Hudson Bay Lowland, although there is some evidence suggesting they once nested much further south	eBird	Low - the study area is outside of this species' breeding range	Nothing further
Avian	Henslow's Sparrow *Centronyx henslowii*	END	END Schedule 1	END	- Open fields with tall grasses, flowering plants, and scattered shrubs; abandoned farm fields, pastures, and wet meadows. - Prefers undisturbed, extensive, dense, tall grasslands. - Avoids grazed, harvested, burned fields, or those crowded with trees and shrubs. **- TPO, CUM, and MAM that are a minimum of 30 ha in size with vegetation over 30 cm in height, a thick thatch layer, and absence of woody vegetation**.	- From Windsor northeast to Ottawa Valley/Montreal area.	NHIC	Low - the study area lacks suitable grassland habitat for this species	Nothing further
Avian	Least Bittern *Ixobrychus exilis*	THR	THR Schedule 1	THR	- Marshes with emergent vegetation surrounded by open water; prefers cattail marshes with a mix of open pools and channels. - Nests are built above marsh water in stands of dense vegetation. **- MAS2-1, MAS3-1, SA and OAO**.	- From Collingwood to Kingston as well as small pockets near Cornwall.	OBBA	Low - the study area lacks suitable marsh habitat for this species	Nothing further
Avian	Red-headed Woodpecker *Melanerpes erythrocephalus*	END	THR Schedule 1	END	- Woodlands and woodland edges, including oak and beech forests, grasslands, orchards, riparian forests, beaver ponds, burns, parks, golf courses, and cemeteries. - Dead trees used for nesting and perching. **- TPS, TPW, CUW, FOD1, FOD2, FOD4-1, FOD6, FOD7, and FOD9 that are open with an abundance of dead trees**.	- Woodland Caribou Provincial Park southeast to Cornwall.	NHIC	Moderate - potential suitable forested habitat present within the study area. This species was not observed during field investigations.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Flora	Butternut *Juglans cinerea*	END	END Schedule 1	END	- Deciduous forests with moist, well-drained soil of pH 5.5 to 8; commonly found along streams. - Often grows alone in sunny openings and near forest edges. **- FOD and mature hedgerows**.	- South of Pembroke to Port Elgin.	MECP Info Request, TRCA Info Request, Matrix Field Observation	Confirmed - this species was observed within the study area	Conduct Butternut Health Assessment to determine whether the tree is a hybrid or a pure specimen
Herpetofaunas	Blanding's Turtle (Great Lakes / St. Lawrence population) *Emydoidea blandingii*	THR	END Schedule 1	END	- Shallow, nutrient-rich habitats; typically large wetlands and shallow lakes with lots of water plants. - Nesting occurs in sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops. - Overwintering occurs in pools about 1 metre in depth. **- SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present**.	- Southern Ontario north to Sudbury, with isolated reports as far north as Timmins.	ORAA	Low - the study area lacks suitable habitat for this species	Nothing further
Herpetofaunas	Jefferson Salamander *Ambystoma jeffersonianum*	END	END Schedule 1	END	- Mature deciduous or mixed upland forest containing, or adjacent to, breeding ponds. - Terrestrial habitat must include small mammal burrows or rock fissures for over-wintering below the frost line. - Breeding ponds are normally ephemeral or vernal woodland pools that dry in late summer. **- FOD where permanent or temporary ponds or pools are present**.	- Most commonly found within the Niagara Escarpment and Carolinian forest regions.	ORAA	Low - the study area lacks ephemeral breeding ponds for this species	Nothing further
Herpetofaunas	Unisexual Ambystoma (Jefferson Salamander dependent population) *Ambystoma laterale-(2) jeffersonianum*	END	END Schedule 1	END	- Mature deciduous or mixed upland forest containing, or adjacent to, breeding ponds. - Terrestrial habitat must include small mammal burrows or rock fissures for over-wintering below the frost line. - Breeding ponds are normally ephemeral or vernal woodland pools that dry in late summer.	- Southern Ontario, centred around the Niagara Escarpment.	ORAA	Low - the study area lacks ephemeral breeding ponds for this species	Nothing further
Mammals	Eastern Small-footed Myotis (Eastern Small-footed Bat) *Myotis leibii*	END	N/A	N/A	- Summer habitat includes rock outcrops, in buildings, under bridges, or in caves, mines or hollow trees. - Roosting locations are typically changed every night. - Winter hibernation occurs in caves or mines, typically drier and colder than sites selected by other bats.	- South of Georgian Bay to Lake Erie and east to the Pembroke area, the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park.	Ontario Mammals, MECP Info Request	Low - the study area lacks suitable habitat such as rock piles or fissures for this species.	Nothing further
Mammals	Little Brown Myotis (Little Brown Bat) *Myotis lucifugus*	END	END Schedule 1	END	- Large-diameter trees, attics, abandoned buildings, and barns often used for summer colonies. - Foraging occurs over water, along waterways, and forest edges, while open areas such as clearcuts or fields are typically avoided. - Hibernacula used in winter include mines and caves that are humid and remain above freezing.	- All across Ontario; concentrated in southern Ontario.	Ontario Mammals, MECP Info Request	Moderate - the study area contains snag tree habitat adjacent to a watercourse and is considered suitable habitat for this species. This species was not observed during field investigations.	Should tree removal occur, acoustic monitoring should be completed. Any tree removal should occur outside of the maternity roosting season of April 1-September 30 of any year.

Mammals	Northern Myotis (Northern Long-eared Bat) *Myotis septentrionalis*	END	END Schedule 1	END	- Typically within the boreal forest, under loose bark or in the cavities of trees. - Foraging occurs over water, along waterways, and forest edges, while open areas such as clearcuts or fields are typically avoided. - Overwintering occurs in cold and humid sites such as caves or mines. - **FOC, FOM, FOD, SWC, SWM, and SWD where suitable roosting (i.e. cavity trees and trees with loose bark) habitat is available**.	- Forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.	Ontario Mammals, MECP Info Request	Moderate - the study area contains snag tree habitat adjacent to a watercourse and is considered suitable habitat for this species. This species was not observed during field investigations.	Should tree removal occur, acoustic monitoring should be completed. Any tree removal should occur outside of the maternity roosting season of April 1-September 30 of any year.
Mammals	Tri-colored Bat *Perimyotis subflavus*	END	END Schedule 1	END	- Day roost and maternity colonies are formed in older forests with large-diameter trees, barns, or other structures. - Foraging occurs over water or along streams in a forest. - Winter hibernacula include caves and mines.	- Southern Ontario north to Sudbury.	Ontario Mammals	Moderate - the study area contains appropriate Oak and Maple trees adjacent to a watercourse and is considered suitable habitat for this species. This species was not observed during field investigations.	Should tree removal occur, acoustic monitoring should be completed. Any tree removal should occur outside of the maternity roosting season of April 1-September 30 of any year.

TOTAL	**17**
Herpetofaunas	**3**
Avian	**9**
Aquatics	**0**
Invertebrates	**0**
Flora	**1**
Mammals	**4**

ESA Status	
END	**10**
THR	**7**
TOTAL SAR	**17**

TABLE 2 Species of Conservation Concern

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat[1, 2]	Known Species Range[1, 2]	Source Identifying Species Record	Probability of Occurrence within Study Area	Conclusions/ Recommendations
Avian	Bald Eagle *Haliaeetus leucocephalus*	SC	No Status	No Status	- Wide variety of habitats near major lakes or rivers. - Tall trees (ie, pine or poplar) typically used for nesting. - Diet consists of fish and dead animals (ie, white-tailed deer). - **FOC, FOM, FOD, SWC, SWM and SWD**.	- Can be found across Ontario, from US border north to Lake of the Woods.	OBBA, eBird	Low - the study area is not along a major river. No nests were observed.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Avian	Barn Swallow *Hirundo rustica*	SC	THR Schedule 1	SC	- Cup-shaped mud nests are built on human-made structures such as open barns, under bridges, and in culverts. - Preferably constructed on rough-cut wood surfaces with right angles. - Foraging habitat includes grassy fields, pastures, cropland, lake and river shorelines, cottage areas and farmyards, islands, wetlands, and tundra. - **TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, and SAF1, adjacent to suitable nesting structures**.	- From southern Ontario north to Hudson Bay.	NHIC, OBBA, eBird, MECP Info Request	Moderate - potential nesting structures present in the bridge and culvert within the study area. This species was not observed during field investigations.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Avian	Canada Warbler *Cardellina canadensis*	SC	THR Schedule 1	SC	- Deciduous or coniferous forests with well-developed, dense shrub layer; commonly wet or in riparian areas. - May also include stands regenerating after natural disturbances (ie, logging). - **FOC3, FOC4, FOM6, FOM7, FOM8, FOD6, FOD7, FOD8, FOD9, SWC, SWM and SWD**.	- All of Ontario.	eBird, MECP Info Request	Moderate - potential suitable forested habitat present within study area. This species was not observed during field investigations.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Avian	Common Nighthawk *Chordeiles minor*	SC	SC Schedule 1	SC	- Open areas with little to no ground vegetation; logged or burned areas, rock barrens, peat bogs, lakeshores, dunes, beaches, and mine tailings. - Less commonly found in cultivated fields, orchards, mine tailings, and along gravel roads and railways. - Nesting habitat is typically open and vegetation free; may include grasslands, pastures, marshes, and riverbanks. - May also include mixed and coniferous forests. - **SD, BB, RB, CUM, BO, FOM, FOX and FOD with sparsely vegetated openings**.	- All of Ontario except for coastal regions of James Bay and Hudson Bay.	OBBA	Low - the study area lacks suitable unvegetated habitat for this species.	Nothing further
Avian	Eastern Wood-pewee *Contopus virens*	SC	SC Schedule 1	SC	- Mid-canopy layer of forest clearings, edges of deciduous and mixed forests, early successional clearings. - **FOC, FOM, FOD, SWD, SWM and CUW**.	- Southern Ontario north to Sudbury.	NHIC, OBBA, eBird, MECP Info Request, Matrix Field Observation	Confirmed - this species was heard during the 2019 field studies, suitable habitat is present within the study area.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Avian	Peregrine Falcon *Falco peregrinus*	SC	No Status	No Status	- Tall, steep cliff ledges or tall buildings from 50 m to 200 m in height, close to large bodies of water. - Can be found in tundra, coastal, prairie or urban areas. - **CLO**.	- Breeding population centered around Lake Superior in northwest Ontario. - May be found migrating across rest of the province.	OBBA, iNaturalist, MECP Info Request	Low - the study area lacks suitable cliff habitat for this species	Nothing further
Avian	Rusty Blackbird *Euphagus carolinus*	SC	SC Schedule 1	SC	- Wet woodlands, swamps, pond edges. - Agricultural land is used for foraging. - Boreal forest is used for breeding; conifer-dominated forests adjacent to wetlands, peat bogs, sedge meadows, marshes, swamps, and beaver ponds.	- Breeding habitat spans Hudson Bay south to Orillia. - May be seen in southern Ontario during migration.	eBird	Low - the study area is outside of this species' breeding range	Nothing further
Avian	Wood Thrush *Hylocichla mustelina*	SC	THR Schedule 1	THR	- Mature deciduous and mixed forests; moist stands of trees with well-developed undergrowth. - Tall trees are used for singing perches. - Nests are built in live saplings, trees, or shrubs, especially sugar maple or American beech. - Preferably large forest mosaics. - **FOD and FOM greater than 1 ha**.	- Southern Ontario north to Hearst.	OBBA, eBird, MECP Info Request	Moderate - potential suitable forested habitat present within study area. This species was not observed during field investigations.	Any vegetation removal should occur outside of the breeding bird window of April 1 to August 31
Herpetofaunas	Eastern Musk Turtle (Stinkpot) *Sternotherus odoratus*	SC	SC Schedule 1	SC	- Shallow ponds, lakes, marshes and slow-moving rivers with abundant emergent vegetation and muddy bottoms. - Nesting occurs in soil, decaying vegetation, rotting wood, rock crevices, muskrat lodges, or on open ground. - Hibernation occurs in the muddy bottoms of suitable wetland habitats. - **MAS, OAO, SAS, SAM, and SAF**.	- South of North Bay, primarily along the eastern shoreline of Georgian Bay and north of Lake Erie and Ontario.	ORAA	Low - the study area lacks suitable habitat for this species. Record is considered historical as it is over 30 years old.	Nothing further
Herpetofaunas	Northern Map Turtle *Graptemys geographica*	SC	SC Schedule 1	SC	- Both lakes and rivers, preferably with slow-moving currents, muddy bottoms, high-quality water, and abundant vegetation. - Habitat must contain suitable basking sites such as rocks and deadheads. - Hibernation occurs at the bottom of deep, slow-moving sections of river. - **OAO, SA** with emergent rocks and fallen trees.	- Southern Ontario, primarily on the shores of Georgian Bay, Lake St. Clair, Lake Erie, and Lake Ontario, and along larger rivers including the Thames, Grand, and Ottawa. - Has also been recorded on Manitoulin Island and north of Timmins.	ORAA, iNaturalist	Low - the study area lacks suitable soft-bottomed aquatic habitat	Nothing further
Herpetofaunas	Snapping Turtle *Chelydra serpentina*	SC	SC Schedule 1	SC	- Shallow wetland habitats with slow-moving water and soft bottoms; ponds, sloughs, shallow bays, river edges, or slow streams. - Nesting occurs on sandy or gravel banks or man-made structures such as roads, dams, and aggregate pits. - Overwintering occurs underwater, underneath logs, sticks, or overhanging banks, deep in mud in marshy areas, or underneath floating mats of vegetation. - **OAO, SA near gravelly or sandy areas**.	- Primarily southern Ontario north to Timmins; also found near Thunder Bay and Kenora.	NHIC, ORAA	Low - the study area lacks suitable soft-bottomed aquatic habitat. However, it could be used as a travel corridor.	Area required for construction will be cleared of any potential turtles prior to construction and fencing will be installed to keep any turtles from entering the work zone.
Herpetofaunas	Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield population) *Pseudacris triseriata*	No Status	THR Schedule 1	THR	- Where both terrestrial and aquatic habitats are found in close proximity with seasonally dry temporary ponds devoid of fish. - Rarely found in permanent ponds. - Terrestrial habitat primarily lowland (marshes or wooded wetlands, low shrubs and grass) with rocks, dead trees, leaves, or in loose soil or animal burrows.	- Can be found from Georgian Bay east to Eganville, and from southern Ontario to south of Algonquin Park.	ORAA	Low - the study area lacks suitable habitat for this species. Record is considered historical as it is over 30 years old.	Nothing further
Invertebrates	Monarch *Danaus plexippus*	SC	END Schedule 1	END	- Open or disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests. - Trees along the north shore of the Great Lakes are used for roosting before migrating across open water. - Caterpillars are confined to meadows and open areas where milkweed grows. - **AL, TP, and CUM where milkweed is present**.	- South of 50° of latitude.	OBA, iNaturalist	Moderate - milkweed plants were observed on site during the field studies. This species was not observed during field investigations.	Milkweed species are recommended to be incorporated into seed mixes during any restoration efforts.
Invertebrates	West Virginia White *Pieris virginiensis*	SC	N/A	N/A	- Moist, deciduous woodlots with a supply of Toothwort (the only food source of larvae).	- Southern Ontario north to Eganville as well as Manitoulin Island, eastern shore of Georgian Bay and Lake Huron. - Concentrated in western Lake Ontario region.	OBA	Low - the study area lacks suitable habitat for this species. Record is considered historical as it is over 30 years old.	Nothing further

TOTAL	**15**
Herpetofaunas	**5**
Avian	**8**
Aquatics	**0**
Invertebrates	**2**
Flora	**0**
Mammals	**0**

ESA Status	
SC	**13**
No Status	**2**
EXP	**0**
TOTAL SCC	**15**