APPENDIX E.1 – Natural Environmental Report

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FINAL

Natural Environment Report

Individual Environmental Assessment for Teston Road Area (Y.R. between Highway 400 and Bathurst Street (Y.R.38)

Presented to:

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Report No. 190261800
July 2024

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

1. INTRODUCTION

1.1 Background

In December 2018, the Minister of the Environment, Conservation, and Parks approved the Terms of Reference for the Teston Road Area Transportation Improvements Individual Environmental Assessment (IEA) study, within the City of Vaughan. York Region retained Morrison Hershfield (MH) to conduct the IEA in accordance with the approved Terms of Reference. The IEA study has examined solutions that will improve transportation throughout the area through a comprehensive IEA process. The purpose of the IEA is to generate a transportation solution that addresses a variety of transportation problems and opportunities in the area. The project considered improvements for the movement of vehicles, pedestrians, cyclists, and transit.

As part of the IEA studies, MH undertook terrestrial and fisheries field investigations in 2020, 2021, and 2022, to help identify any environmental constraints or opportunities in the area, and to provide recommendations on transportation improvement alternatives. This *Natural Environment Report* provides detailed existing conditions information within the project limits, an impact assessment for the preferred transportation improvement alternatives, as well as next steps and preliminary avoidance and mitigation measures required for the proposed undertakings.

The overall IEA study area covers Highway 400 to Bathurst Street (Regional Road 38) and Kirby Road to Major MacKenzie Drive (Regional Road 25), within the City of Vaughan (see **Figure 1**). The project is located within the Ministry of Natural Resources and Forestry (MNRF) District of Aurora, and within the jurisdiction of the Toronto and Region Conservation Authority (TRCA).

Figure 1: Teston Road Overall IEA Study Area

1.2 Project Rationale and Proposed Scope of Work

By the year 2051, York Region is expected to reach 2.08 million residents (York Region, 2023). Within York Region, the City of Vaughan increased from a population of 15,000 in 1970 to 330,000

in 2016. Following the closing of the Keele Valley Landfill in 2002, the Teston Road area now serves many new residential communities, growing commercial areas, new industrial facilities, and additional development applications are expected to continue in the future. To support this rapid and continued growth, the connectivity structure needs to be changed into a fully urbanized road network.

Teston Road is a key regional east/west arterial road, with an interchange at Highway 400, within the City of Vaughan. The Teston Road Area Improvements is an Urban Regional Designated Area as classified by York Region's 2022 Transportation Master Plan.

Improvements to Teston Road will include the continuation of Teston Road from Rodinea Road to Dufferin Street as well as widening of the existing section of Teston Road east of Dufferin Street to Bathurst Street. Discontinuity on Teston Road between Keele Street and Dufferin Street acts as a barrier to local and regional travel. Continuous regional transportation connectivity through the northern section of the City is deficient and the Teston Road area improvements will improve transportation connectivity and help to accommodate predicted growth.

The discontinuous roadway is also part of the regional cycling network. The current network requires out of way travel by cyclists and pedestrians, channeling additional cycling and pedestrian traffic on Keele Street and Dufferin Street. The continuation of Teston Road will improve the cycling network's connectivity and allow cyclists and other active transportation users to connect to the North Maple Regional Park.

The proposed Kirby GO station on the Barrie GO Transit rail line is in the southwest corner of the Kirby Road and Keele Street intersection within the project area. The York Region 2041 Transportation Master Plan aims to increase transit within the region, designating the Teston Road corridor between Keele Street and Bathurst Street, as a frequent transit network. The Teston Road improvements will allow for increased public transit travel, diversifying options for travelers and working to reduce vehicle emissions.

Without making improvements to Teston Road, preliminary analysis deemed parallel corridors, Kirby Road and Major Mackenzie Drive, as 'over-congested' when compared for predicted growth. The expected future condition in the absence of improvements to Teston Road would result in an unacceptable level of service for commuters and goods movement, and in higher levels of air pollution due to higher vehicle emissions. The Teston Road area improvements aim to address congestion and out-of-way travel currently faced by commuters attempting to access Highway 400.

The Teston Road area transportation improvements are being undertaken to improve the efficiency, safety, and continuity of the transportation network within the project area.

When forming the alternative solutions to address the Teston Road area improvements, the following principles were considered; effective and efficient use of existing infrastructure, developing a network that focuses on economic growth, livability, health, and social wellbeing, reducing impacts to the natural environment, maintaining financial stability, accessibility, and transparency, and effective coordination with other local initiatives. The alternative solutions were then assessed by analyzing their ability to address these problems and opportunities.

The results of the design alternative evaluation were made available to the public and other stakeholders to provide feedback. After receiving feedback, the project team confirmed the preferred design alternative which includes widening Teston Road from a two-lane to four-lane arterial road throughout the entire project area. There will be an at-grade GO rail crossing with improved alignment and long-term property protection for the GO rail between Keele Street and Rodinea Road, a 40 m single span bridge will cross the East Don River to the west of Dufferin Street, and from Dufferin Street to Bathurst Street the existing roadway will widen equally on both sides to four lanes.

2. BACKGROUND DATA COLLECTION

2.1 Background Screening

Prior to completion of field surveys, background data specific to the project area was collected and reviewed. Background data collection is important in determining environmental conditions and limitations within the project area, including designated natural areas and records of Species at Risk (SAR). For the purposes of this study, available online and print sources were accessed, and correspondence was completed with the MNRF – Aurora District office. Background information regarding the Teston Road project area was collected and synthesized from the following sources:

- Natural History of Canadian Mammals (Naughton, 2012)
- Ontario Breeding Bird Atlas (OBBA)
- Ontario Reptile and Amphibian Atlas (ORAA)
- Ontario Butterfly Atlas (OBA)
- Species at Risk in Ontario (SARO) list
- Land Information Ontario (LIO)
- Natural Heritage Information Centre (NHIC)
- 2022 York Region Official Plan (York Region, 2023)
- Fish ON-Line (MNRF, 2022)
- Aquatic Species at Risk Mapping (DFO, 2022)
- Toporama (Natural Resources Canada)

2.2 Agency Consultation

Additional information regarding natural heritage features in the project area was requested directly from the MNRF Aurora District office as required. Reports on relevant Areas of Natural and Scientific Interest (ANSI) and Provincially Significant Wetlands (PSW) were received from the MNRF on November 23, 2021, and a record of this correspondence is included in **APPENDIX A**. Meetings with the MNRF, Ministry of Environment, Conservation and Parks (MECP), and TRCA have also been attended by MH since commencement of the project, shown in **Table 1**.

Table 1: Agency Meetings

	Meeting Organization	
TRCA	**MECP**	**MNRF**
June 3, 2020 June 2, 2021 October 4, 2021 February 18, 2022 May 24, 2023	November 6, 2020 January 12, 2021 October 5, 2021 February 4, 2022 February 22, 2022 May 24, 2023	November 23, 2021 June 8, 2023

3. FIELD INVESTIGATIONS

Aquatic and terrestrial field investigations were undertaken over the course of three (3) years, from 2020 to 2022. Field investigations in Year 1 began with preliminary investigations in the overall IEA study area from Highway 400 east to Bathurst Street and from Major Mackenzie Drive north to Kirby Road (discussed above and illustrated in **Figure 1**). In subsequent years, investigations became more detailed within refined study limits as the project progressed, proposed solutions were developed, and the preliminary design and alignment for the Technically Preferred Alternative for the Teston Road extension became known.

In Year 2, terrestrial field surveys were completed within a focal study area, extending from east of Keele Street to west of Dufferin Street, and from north of Major Mackenzie Drive to south of Kirby Road. These investigations focused on forest and wetland tracts west of Dufferin Road and grassland areas east of Keele Street identified in Year 1, which had been determined to provide the highest quality wildlife habitat in the overall IEA study area, particularly for SAR. These areas were also identified as likely to be impacted by the project (though the alignment for the Technically Preferred Alternative for the Teston Road extension was not yet determined). Fisheries surveys were deemed unnecessary in Year 2, as surveys completed in Year 1 provided sufficient information to assist in informing on the selection of the Technically Preferred Alternative.

Aquatic and terrestrial field investigations undertaken in Year 3 were completed within the Technically Preferred Alternative study area, to augment information known about this area from Years 1 and 2. Investigations focused on areas alongside and between the existing sections of Teston Road east of Keele Street and west of Dufferin Street, along the limits of the Technically Preferred Alternative. The field investigations in Year 3 also included surveys to document existing conditions to the east of the Year 2 focal study area, north and south of Teston Road between Dufferin Street and Bathurst Street, where widening of the existing section of Teston Road has also been identified.

Mapping of the locations and limits of the overall IEA, focal, and Technically Preferred Alternative study areas in Years 1, 2, and 3, respectively, can be found within **Figure 2**.

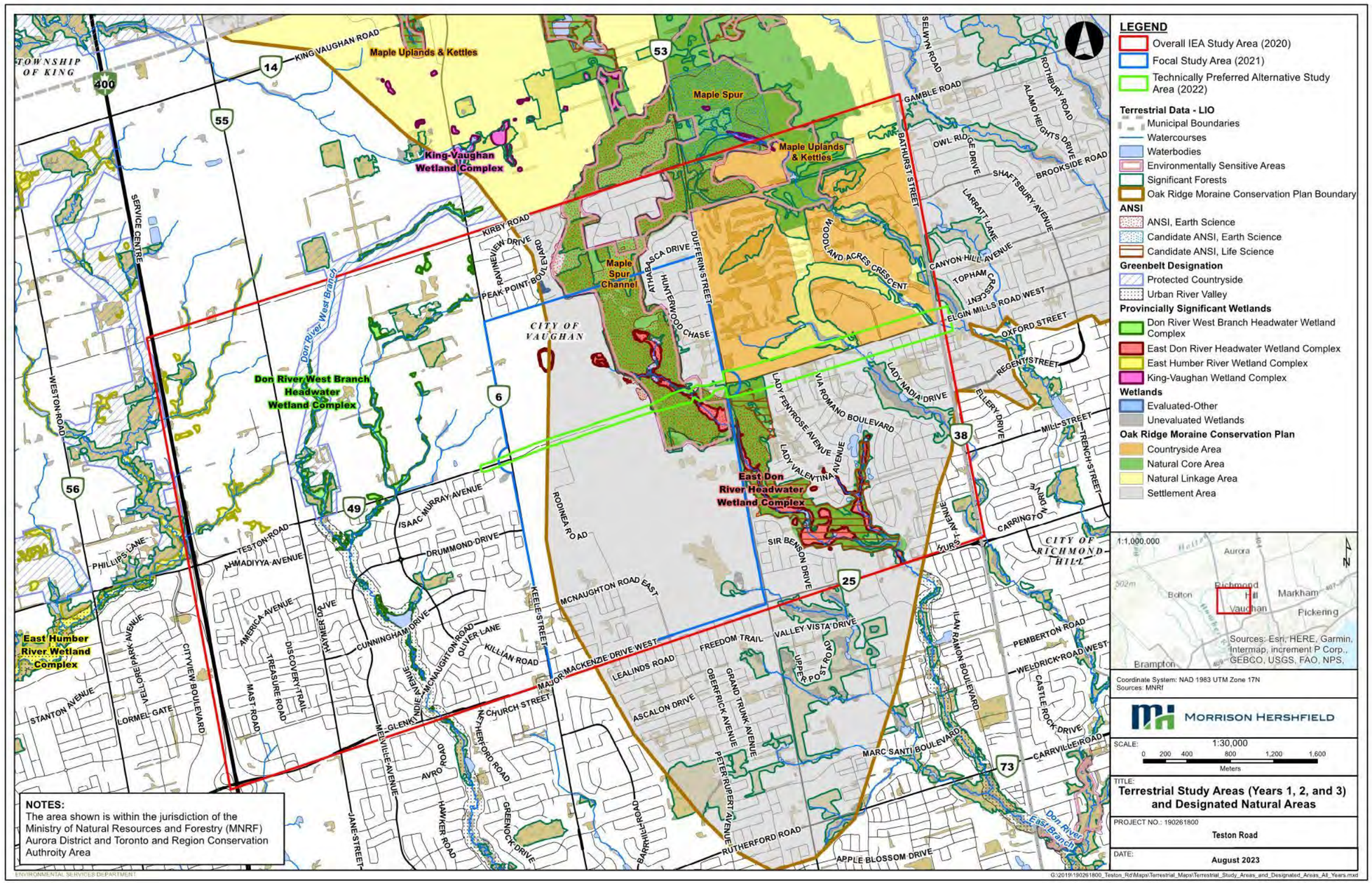

Figure 2:Terrestrial Study Areas (Years 1, 2, and 3) and Designated Natural Areas

3.1 Aquatic Sampling Plan and Rationale

Year 1

Fisheries surveys completed in Year 1 included preliminary fisheries assessments for all watercourses within the overall IEA study area, including the East Humber River tributaries, East Don River tributaries and West Don River tributaries, to characterize the existing conditions. This assessment included:

- Visual review of general habitat characteristics to ground truth aerial imagery.
- Identification of stream flow permanency during high and low water seasons.
- Baseline stream water quality including Dissolved Oxygen, Turbidity, pH, and Temperature.
- Identification of potential critical or specialized habitat areas, including ground water seeps and headwater locations.
- Incidental observations of fish to determine the presence of permanent fish habitat.

Year 2

Fisheries surveys were deemed unnecessary in Year 2, as surveys completed in Year 1 provided sufficient information to assist in informing on the selection of the Technically Preferred Alternative in Year 2. Therefore, detailed fisheries habitat and community investigations were deferred until Year 3, until after the Technically Preferred Alternative had been selected, to focus surveys on this area.

Year 3

Fisheries surveys in Year 3 included spring (May 9, 2022) and summer (August 18, 2022) surveys and were focused on the Don River East Branch located west of Dufferin Street (Site 1) as well as the two watercourse crossings along Teston Road between Dufferin Street and Bathurst Street (Site 2 and 3). Site 1 was also a part of the previous high-level survey in sampling Year 1, and Sites 2 and 3 were surveyed for the first time in sampling Year 3. A figure showing the location of these sites can be found in **Figure 3**.

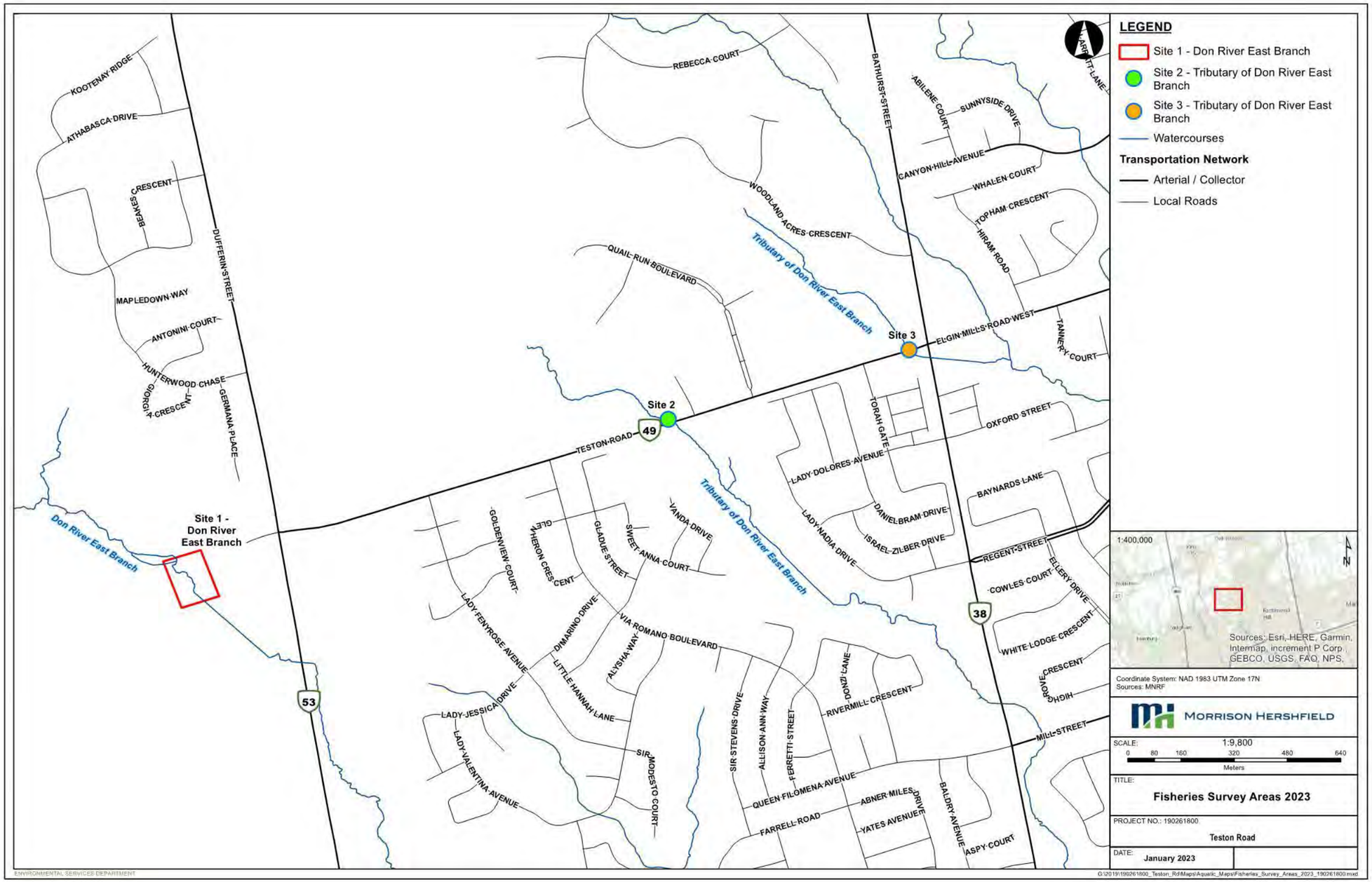

Figure 3: Technically Preferred Alternative Study Area Fisheries Survey Locations

Fisheries surveys in Year 3 included:

- Watercourse type characterization
- Determination or confirmation of fish species present through electrofishing
- Confirmation of in water timing windows
- Identification of specialized habitat features
- Identification of physical barriers to fish movement
- Determination of aquatic habitat sensitivity
- Water quality monitoring

3.2 Terrestrial Sampling Plan and Rationale

Year 1

Terrestrial field investigations were undertaken in Year 1 to establish a general baseline and inform on the existing terrestrial environment conditions within the overall IEA study area The Year 1 field investigations were conducted on May 25, June 9, July 23, and July 29, 2020, and included the following:

- Collection of general wildlife observations including wildlife signs or evidence of presence (such as scat, trails, browse, nests, burrows, excavated holes, vocalizations etc.) to gain insight into wildlife movement corridors, and overall use of the study area by wildlife.
- Vegetation inventories to contribute to a plant species list for the area over several years and contribute to Ecological Land Classification (ELC) completion.
- Preliminary field investigations to ground truth background information and identify habitat for terrestrial species at a landscape level.

Year 2

The Year 2 terrestrial field surveys within the focal study area were undertaken within the highest quality wildlife habitat area identified in Year 1, which had also been identified as a general area likely to be impacted by the project. Field investigations within the focal study area were completed on June 22, June 30, and July 9, 2021, and included the following:

- Breeding Bird Surveys (BBS) conducted during peak breeding bird season.
  - A total of 17 locations (#'s 1-17) were selected to sample birds within the various vegetation communities present within the focal study area by way of point count surveys, and were spaced far enough apart (i.e., >100 m apart) to avoid double counting individuals.
- Vegetation inventories to contribute to a plant species list for the area over several years and contribute to ELC completion.
- Delineation of ELC units, to Community Series Level where possible, for the focal study area.

    - Existing ELC data available from the TRCA was used and was confirmed and updated where necessary to fill in gaps in the ELC, or to reflect 2021 conditions where discrepancies were present. ELC was completed using TRCA ELC (TRCA, 2022) methods, for consistency with the existing ELC communities, except for cultural communities (residential, commercial, agricultural, etc.) which were completed using Ecological Land Classification for Southern Ontario (Lee et al., 2008), as no applicable ELC communities exist under the TRCA ELC.
- Continued investigations within wetlands and open water areas to determine SAR turtle presence [e.g., Blanding's Turtle (*Emydoidea blandingii*)] or confirm extent of occupancy for species already observed [e.g., Snapping Turtle (*Chelydra serpentina*)].
- Surveys of grassland habitat (the closed Vaughan Landfill property) for SAR [e.g., Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*), Grasshopper Sparrow (*Ammodramus savannarum*), and Monarch (*Danaus plexippus*)].
- Surveys of forests, woodlands, and treed areas to determine presence of the following additional potential SAR within these communities:
    - Acadian Flycatcher (*Empidonax virescens*)
    - Butternut (*Juglans cinerea*)
    - Canada Warbler (*Cardellina canadensis*)
    - Cerulean Warbler (*Setophaga cerulea*)
    - Evening Grosbeak (*Coccothraustes vespertinus*)
    - Eastern Ribbonsnake (*Thamnophis sauritus*)
- Surveys of forests, woodlands, and treed areas to confirm extent of occupancy for Special Concern SAR Eastern Wood-Pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*), which were already confirmed in Year 1.
- Completion of Phase I: Bat Habitat Suitability Assessment from the *Survey Protocol for Species at Risk Bats within Treed Habitats: Little Brown Myotis (Myotis lucifuga), Northern Myotis (Myotis septentrionalis), & Tri-colored Bat (Perimyotis subflavus)* (MNRF, 2017) (hereafter referred to as The Protocol)
    - Based on The Protocol, suitable maternity roost habitat includes coniferous, deciduous or mixed wooded ecosites that contain:
        - Trees with 10 cm or greater diameter at breast height (DBH); and
        - Trees of suitable species to exhibit cracks, cavities, holes, or loose peeling bark.

Year 3

The Year 3 terrestrial surveys built upon the surveys completed in Years 1 and 2, as there was overlap between the study areas in all years (**Figure 2**). However, the Year 3 surveys focused on the areas alongside the Technically Preferred Alternative and focused on confirming existing conditions within the area determined to be most likely to be impacted. The field surveys within the Technically Preferred Alternative study area were completed on May 3, 4, 5, 6, and 9, July 7, and August 18, 2022, and included:

- Transect surveys of anticipated areas of impact to identify wildlife habitat features, such as wildlife travel corridors, vernal pools, or other specialized habitats.
- Transect surveys of impacted forests, woodlands, and treed areas in spring and summer to determine SAR and SAR habitat presence within these communities for SAR listed in the Terms of Reference for the Teston Road area and/or background screening resources, that had not yet been confirmed, including:
  - Acadian Flycatcher
  - American Ginseng (*Panax quinquefolis*)
  - Canada Warbler
  - Cerulean Warbler
  - Evening Grosbeak
  - Least Bittern (*Ixobrychus exilis*)
  - Eastern Ribbonsnake
- Surveys of impacted structures (culverts, bridges, buildings) for Barn Swallow (*Hirundo rustica*) nests and for Chimney Swift (*Chaetura pelagica*) roosting/nesting sites (buildings only).
- Leaf-off surveys for bat maternity roost trees (Phase II: Identification of Suitable Maternity Roost Trees of The Protocol) in spring, consisting of:
  - Documentation of the characteristics and locations of all potential bat maternity roost trees (trees with 10 cm or greater DBH with cavities, cracks, crevices, knotholes, peeling bark, or other such vulnerabilities) within the road footprint, the anticipated grading limits, and a 15 m buffer to account for minor changes in the design details or road alignment, using the preliminary design for the Technically Preferred Alternative current at the time of the surveys in spring, 2022.
- Surveys of impacted forests, woodlands, and treed areas in spring/summer to confirm extent of occupancy for SAR that were already confirmed in Year 1 and/or Year 2: Butternut, Eastern Wood-Pewee, and Wood Thrush.
- Continued investigations within wetlands and open water areas to determine SAR turtle presence [e.g., Blanding's Turtle (*Emydoidea blandingii*)] or confirm extent of occupancy for species already observed [e.g., Snapping Turtle (*Chelydra serpentina*)].
- Continued investigations to identify potential habitat for SAR such as Bank Swallow (*Riparia riparia*), Common Nighthawk (*Chordeiles minor*), Golden-winged Warbler (*Vermivora chrysoptera*), and Red-headed Woodpecker (*Melanerpes erythrocephalus*), as none had been observed to date.
- Jefferson Salamander (*Ambystoma jeffersonianum*) habitat suitability assessments to inform whether species-specific surveys should be identified as a future commitment.
- Confirmation of existing conditions for 120 m north and south of the existing Teston Road along the proposed widening limits between Dufferin Street and Bathurst Street, including completion of ELC and assessment of SAR habitat.

  - Consistent with Year 2, existing ELC data from the TRCA were used where available and updated where necessary to fill in gaps in the ELC, or to reflect current conditions

where discrepancies were present. ELC was completed using TRCA ELC (TRCA, 2022) methods, for consistency with the existing ELC, except for cultural communities (residential, commercial, agricultural, etc.) which were completed using *Ecological Land Classification for Southern Ontario* (Lee et al., 2008), as no applicable ELC communities exist under the TRCA ELC for such areas.

4. EXISTING CONDITIONS

4.1 Aquatic Ecosystem Existing Conditions

Year 1

A review of available background data as well as preliminary field investigations have confirmed that there are multiple areas of important aquatic habitat within the overall IEA study area.

- The overall IEA study area contains the headwaters of the East Don River, specifically the area within the McGill Area Environmental Significant Area (ESA #73) within the Teston Road gap between Keele Street and Dufferin Street. The tributary within this location contains permanent water flow that originates from Maple Down Pond and Maple Ridge Pond, as well as natural wetland habitat west of Hunterwood Chase Road.
- The headwaters within the study area also contain various stream features such as historical ponds, ground water seeps and springs, and the presence of watercress.
- Fish were present in the headwater streams within the Teston Road gap between Keele Street and Dufferin Street, confirming that this area provides permanent fish habitat.

Redside Dace (*Clinostomus elogatus*) have been recorded by Fisheries and Oceans Canada, the Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre, and Land Information Ontario as occurring within multiple tributaries within the Don River East Branch. Preliminary field investigations have determined that suitable habitat for Redside Dace is present within the Don River East Branch.

Year 2

Fisheries surveys were deemed unnecessary in Year 2, as surveys completed in Year 1 provided sufficient information to assist in informing on the selection of the Technically Preferred Alternative in Year 2.

Year 3

Fisheries surveys in Year 3 were focused on the Don River East Branch located west of Dufferin Street (Site 1) as well as the two watercourse crossings along Teston Road between Dufferin Street and Bathurst Street (Site 2 and 3).

Site 1 – Don River East Branch Located West of Dufferin Street

This stretch of aquatic habitat is located within the natural area west of the Teston Road and Dufferin Street intersection. The detailed aquatic and fisheries habitat survey was completed for this area on August 18, 2022. The area of investigation included a 200 m channel reach within the expected path of the construction of the new bridge, downstream of the private pond and dam.

This study area contains the headwaters for the East Don River. The surveyed reach was a defined channel as it flowed through a mixed forest directly downstream of the private pond, before opening into open marsh habitat and continuing southeast towards Dufferin Street where it crosses just north of the Eagles Nest Golf Course. The pond dam acts as a barrier to fish

movement; however a small branching channel flows to the west around the pond connecting the tributary to the upstream habitat. The main channel contained permanent flow and consisted of 100% run habitat, with a mean wetted depth of 3 cm and a mean wetted width of 40 cm. The bankfull depth was approximate 12 cm and the bankfull width was approximately 3.8 m. The substrates consisted primarily of silt, followed by sand, detritus, and boulders. The banks in this area are moderately unstable and show signs of erosion. In-stream cover was dominated by instream and overhanging woody debris, while instream and overhanging vegetation and organic debris were also present. Emergent vegetation was present within the marsh habitat and consisted primarily of Reed Canary Grass (*Phalaris arundinacea*) and Common Jewelweed (*Impatiens capensis*). Iron staining was present approximately 100 m downstream of the dam within the marsh area, indicating groundwater upwelling is present.

The sediment substrate, which was found within the channel primarily 50-80 m downstream from the dam where the channel gradient declines, appeared unnatural compared to the native substrate further downstream. This indicated the dam and pond may be holding and subsequently releasing sediment during large rainfall or snowmelt events.

Fisheries sampling was completed within the channel, which resulted in the capture of Blacknose Dace, confirming that this channel provides direct fish habitat. Photos of the habitat at Site 1 as well as the fish capture can be seen in the photo record in **APPENDIX B**. Water quality sampling results can be found in **Table 2**.

Site 2 – Tributary of Don River East Branch, Culvert Crossing Teston Road West of Saul Court.

This tributary flows from north to south through a 7.5 m wide and 1.5 m high box culvert under Teston road, 70 m west of Saul Court. The channel upstream (north) of Teston Road is a small, incised channel within dense cattails (*Typha* spp.) and Common Reed (*Phragmites australis ssp. australis*). The channel contained permanent flow and was 100% run habitat, with a wetted depth of 10 cm and a wetted width of 15 cm. The substrate consisted of muck and detritus. The dense vegetation provided 100% shore cover. Permission to Enter upstream of Teston Road was not available and this area may need further studies at later design stages.

Downstream (south) of Teston Road the channel leads south through private property where it is crossed by a privately owned bridge approximately 7 m wide consisting of three corrugated steel pipe culverts. This reach is 100% flats habitat and had limited to no flow with a mean wetted depth of 7 cm and a wetted width of 80 cm. The bankfull depth was 17 cm and the bankfull width was 4 m. The dominant substrate was silt, with detritus also present. In stream cover was abundant and included in stream and overhanging vegetation and woody debris, as well as organic debris. The emergent vegetation consisted of cattails and upland species, and duckweed (*Lemna* sp.) was also present floating vegetation as the channel was not flowing.

Fisheries sampling was not completed at this site as the water depth was insufficient to sample upstream of Teston Road, and downstream of the bridge is classified as Occupied Redside Dace Habitat and therefore sampling this reach is prohibited by MNRF. No fish were seen during the survey and low water levels as well as dense vegetation suggest fish passage is unlikely within the sampled reach.

In situ water quality sampling results can be found below in **Table 2** and photos of the site can be found in **APPENDIX B**.

Table 2: Teston Road Water Quality Monitoring - August 18, 2022

Water Quality Parameters	Site 1	Site 2	Site 3
Turbidity (NTU)	0.0	0.0	Dry
Dissolved Oxygen (mg/L, %)	4.1, 49	5.4, 58	Dry
Conductivity (mS/cm)	1.90	1.34	Dry
Water Temperature (°C)	21.9	17.2	Dry
Air Temperature (°C)	27	28	27
Velocity (m/s)	0.17	Nil (i.e., stagnant)	Dry

Site 3 – Tributary of East Don River, Culvert Crossing Teston Road at Bathurst Street

This tributary flows from north to south into a 1.4 m concrete pipe inlet located 60 m west of Bathurst Street. The tributary is then piped underground southwest approximately 325 m where it emerges to join a second East Don River tributary. The channel was flowing during the spring survey and dry during the summer survey, indicating this channel is intermittent or ephemeral in nature. Landowner access beyond the right of way was not granted and the site survey were completed from within the right of way. From the culvert inlet to the edge of the right of way, the substrate consists of cobble, silt, and boulder, beyond the right of way the channel is low gradient and silt is dominant. Fisheries sampling was not completed at this site as conditions were dry, and no fish were observed during visual surveys.

Photos of the site can be found in **APPENDIX B**. Fisheries field data sheets for all sites can be found in **APPENDIX C**. Maps of the aquatic survey areas are shown below in **Figure 4** and **Figure 5**.

Based on background information as well as data collected through field investigations, the in-water work timing windows for each watercourse within the project area ire listed below in **Table 3**.

Table 3: Fisheries In-Water Work Timing Windows

Watercourse	In-Water Work Timing Window (When Work is Allowed)
Site 1 – Don River East Branch located west of Dufferin Street	June 15 to September 15
Site 2 – Tributary of Don River East Branch, Culvert Crossing Teston Road west of Saul Court	July 1 to September 15 (due to presence of Redside Dace)
Site 3 – Tributary of East Don River, Culvert Crossing Teston Road at Bathurst Street	July 1 to March 31

Figure 4: Aquatic Existing Conditions Site 1

Figure 5: Aquatic Existing Conditions Site 2 and Site 3

4.2 Terrestrial Ecosystem Existing Conditions

The following subsections provide a description of the terrestrial features and functions within the Year 1, Year 2, and Year 3 study areas, with a focus on existing conditions occurring within the Year 3 Technically Preferred Alternative limits, where the project will occur. For additional detail on the Year 1 and Year 2 findings, as well as comprehensive lists of plant and wildlife species observed during all years of the field surveys, refer to **APPENDIX D**. A photographic record documenting the terrestrial features identified over the course of the field surveys in all years combined can be found in **APPENDIX B**.

4.2.1 Designated Natural Areas

Designated natural areas are defined by resource agencies, municipalities, the government and/or public, through legislation, policies, or approved management plans, to have special or unique value. Such areas may have a variety of ecological, recreational, and/or aesthetic features and functions that are highly valued.

In addition to available online resources, a review of background documents received from the MNRF pertaining to designated natural areas located along the limits of the existing and future extension of Teston Road was completed, which included an *Inventory of the Life Science Maple Uplands & Kettle Wetlands and Earth Science Oak Ridges Moraine Maple Spur Areas of Natural and Scientific Interest, City Of Vaughan, Ontario* (MNRF, 2000) and *Provincially Significant East Don River Headwater Wetland Complex Summary* (GEM Services Inc., 2019).

As described in **Section 3** and shown in **Figure 2**, each of the three (3) years of terrestrial field surveys had varying survey limits, with each subsequent year of surveys focusing more closely around anticipated areas of impact as the project plans progressed. As a result, various designated natural areas were associated with each study area, and each year. Designated natural areas noted within each study area, per year, are summarized in **Table 4**.

Table 4: Designated Natural Areas within Overall IEA, Focal, and Technically Preferred Alternative Study Areas

Designated Natural Area	Present in Overall IEA Study Area (Y/N)?	Present in Focal Study Area (Y/N)?	Present in Technically Preferred Alternative Study Area (Y/N)?
Don River West Branch Headwater Wetland Complex PSW	Y	N	N
East Humber River Wetland Complex PSW	Y	N	N
East Don River Headwater Wetland Complex PSW	Y	Y	Y
King-Vaughan Wetland Complex PSW	Y	N	N

Designated Natural Area	Present in Overall IEA Study Area (Y/N)?	Present in Focal Study Area (Y/N)?	Present in Technically Preferred Alternative Study Area (Y/N)?
Evaluated Other (non-provincially significant) Wetlands	Y	N	N
Unevaluated Wetlands	Y	Y	Y
McGill Area Environmental Significant Area #73	Y	Y	Y
Maple Spur Channel Earth Science ANSI	Y	Y	Y
Maple Uplands and Kettles Candidate Life Science ANSI	Y	Y	Y
Maple Spur Candidate Earth Science ANSI	Y	N	N
York Region's Regional Greenlands System	Y	Y	Y
Significant Woodland/Forest	Y	Y	Y
Oak Ridges Moraine Conservation Plan Protected Areas – Countryside Area	Y	Y	Y
Oak Ridges Moraine Conservation Plan Protected Areas – Natural Core Area	Y	Y	Y
Oak Ridges Moraine Conservation Plan Protected Areas – Natural Linkage Area	Y	N	Y
Oak Ridges Moraine Conservation Plan Protected Areas – Settlement Area	Y	Y	Y
Greenbelt Plan Protected Areas – Protected Countryside	Y	N	N
Greenbelt Plan Protected Areas – Urban River Valley	Y	N	N

4.2.1.1 Designated Natural Areas within and Adjacent to the Technically Preferred Alternative Study Area

Life Science Maple Uplands & Kettle Wetlands and Earth Science Oak Ridges Moraine Maple Spur Areas of Natural and Scientific Interest

According to the *Inventory of the Life Science Maple Uplands & Kettle Wetlands and Earth Science Oak Ridges Moraine Maple Spur Areas of Natural and Scientific Interest,* the Maple Uplands & Kettle Wetlands are significant due to the earth science features present, as it contains kettle and meltwater channel features characteristic of moraine physiography. During de-

glaciation, most of the area was occupied by a large block of glacial ice, which melted to leave behind a large, flat-bottomed depression or “kettle”, which occupies the central portion of the site and is the basis for selection of the area as being regionally significant. Around the large kettle formation, the landscape is dotted with small kettle depressions underlain by peat and muck deposits, which sustain a variety of wetlands.

The kettle is characterized by a number of narrow spillway or meltwater channels, of which the largest and best developed is a well-defined valley system, which forms the headwaters of the East Don River. The sand deposits in this area constitute a highly sensitive recharge area, which discharges in the southern part of the ANSI and further south providing a major headwater source for the East Branch of the Don River; waters percolating into the highly permeable sands of the ANSI are discharged in the ANSI and to the south, as headwater sources for the Don River watershed. River valleys such as the East Don River provide important ecological corridors and play an important role in maintaining ecological functions, by allowing for the physical passage and genetic flow of animals and plants.

This ANSI is also noteworthy for its high diversity. Its forests are largely intermediate aged to semi-mature, with some trees in excess of 100 years old, and with no recent logging activity. The large forest area provides critical forest interior habitat (i.e., forest habitat at least 120 m from a forest edge) for area sensitive species that depend on this rare habitat type.

Provincially Significant East Don River Headwater Wetland Complex

According to the *Provincially Significant East Don River Headwater Wetland Complex Summary* (GEM Services Inc., 2019), wetlands are considered rare in this region (i.e., Ecoregion 6E), with an estimate of only 6% wetland land cover. The East Don River Headwater Wetland Complex received a high score for its hydrological component, as the wetlands in the complex contribute to flood attenuation, short term water quality improvement, long term nutrient trapping, and groundwater recharge and discharge in the area. The wetlands constitute 81% of all of the water detention or storage areas in the East Don River upstream catchment, which covers an area 654 ha in size. Most of the wetlands are hydrologically linked to one another by watercourses within the complex.

Wildlife has been noted moving between wetlands within the PSW complex, as well as between the wetlands and surrounding upland habitats. The wetlands have been shown to support and sustain numerous provincially significant species and/or SAR, such as Redside Dace, Barn Swallow, Midland Painted Turtle, Wood Thrush, and Eastern Wood-Pewee. Furthermore, the wetlands provide stopover habitat for migrating waterfowl, and support breeding Wood Ducks (*Aix sponsa*), Mallards (*Anas platyrhynchos*), and Canada Geese (*Branta canadensis*). The East Don wetlands also support breeding populations of amphibians. These amphibians require wetlands for breeding and forested habitats for feeding and hibernating, and they need to be able to travel between these habitats seasonally. In addition to the travel corridors between breeding wetlands and upland habitats, there are also wildlife corridors along the forested East Don River valley corridor and its tributaries.

McGill Area Environmental Significant Area

The McGill Area Environmental Significant Area #73 is ~344 ha in size and contained within the Don River watershed. Environmental Significant Areas, such as the McGill Area Environmental Significant Area #73, are conservation lands owned by TRCA, protecting features such as valley and stream corridors, flood plains, and Lake Ontario shore lands.

Oak Ridges Moraine

According to the *Oak Ridges Moraine Conservation Plan* (Ontario, 2017), the purpose of Natural Core Areas identified within the Oak Ridges Moraine (ORM) plan area is to maintain, and where possible improve or restore, the ecological integrity of the plan area, by maintaining (and where possible improving or restoring) the health, diversity, size, and connectivity of key natural heritage features, key hydrologic features and the related ecological functions, maintaining or restoring natural self-sustaining vegetation and wildlife habitat, maintaining the quantity and quality of groundwater and surface water, maintaining groundwater recharge, maintaining natural stream form and flow characteristics, protecting landform features, and protecting and restoring natural areas and features that sequester carbon and provide ecological functions (including water storage) to help reduce the impacts of climate change (Ontario, 2017).

The purpose of Natural Linkage Areas identified within the ORM plan area is to maintain, and where possible improve or restore, the ecological integrity of the plan area, and to maintain (and where possible improve or restore) regional-scale open space linkages between Natural Core Areas and along river valleys and stream corridors, by, maintaining (and where possible improving or restoring) the health, diversity, size, and connectivity of key heritage features, key hydrologic features and the related ecological functions, maintaining (and where possible improving or restoring) natural self-sustaining vegetation over large parts of the area to facilitate movement of plants and animals, maintaining a natural continuous east-west connection and additional connections to river valleys and streams north and south of the plan area, maintaining the quantity and quality of groundwater and surface water, maintaining groundwater recharge, maintaining natural stream form and flow characteristics, protecting landform features, and protecting and restoring natural areas and features that sequester carbon and provide ecological functions (including water storage) to help reduce the impacts of climate change (Ontario, 2017).

The purpose of Countryside Areas identified within the ORM plan area is to encourage agricultural and other rural uses that support the Plan's objectives by protecting prime agricultural areas, promoting and protecting agricultural and other rural land uses and normal farm practices, maintaining the rural character of rural settlements, protecting and restoring natural areas and features that sequester carbon and provide ecological functions (including water storage) to help reduce the impacts of climate change, and maintaining existing public service facilities and adapting them, where feasible, to meet the needs of the community (Ontario, 2017).

The purpose of Settlement Areas identified within the ORM plan area is to focus and contain urban growth by encouraging the development of communities that provide their residents with convenient access to an appropriate mix of employment, transportation options and local services and a full range of housing and public service facilities, minimizing the encroachment and impact of development on the ecological functions and hydrological features of the ORM plan area, promoting the efficient use of land with transit-supportive densities through intensification and

redevelopment within existing urban areas, and providing for the continuation and development of urban land uses consistent with the growth management strategies identified in the applicable official plans (Ontario, 2017).

York Region Significant Woodlands

According to *York Region Significant Woodlands Study* (NSEI, 2005), woodlands (sometimes called forests) satisfying any of the following are recommended as being significant in York Region: any woodland that supports any rare or vulnerable (G1, G2, G3, S1, S2, or S3) "plant or animal species or community, as designated by NHIC, or any SAR designated by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or Committee on the Status of Species at Risk in Ontario (COSSARO) as Threatened, Endangered, or of Special Concern, any woodland that is within 30 metres of a watercourse, surface water feature or evaluated wetland, and any woodland over 2 ha in size that is within 100 metres of another significant feature or that occurs within the Regional Greenlands System…". The Significant Forests within the Technically Preferred Alternative limits would meet all of these criteria, based on the results of the terrestrial field investigations described herein.

The features and functions of the Significant Forests, ORM plan areas, ANSIs, and PSW in the Teston Road area also contribute to these same general areas being included as part of York Region's Regional Greenlands System.

4.2.2 Rare and Species at Risk Vegetation and Ecological Land Classification

Based on MH's field investigations, a total of 44 different ELC communities were confirmed within the focal study area, which also contains the west portion of the Technically Preferred Alternative study area from Keele Street to Dufferin Street (**Figure 2**). Approximately 43% (19/44) of these communities were considered communities of Conservation Concern by the TRCA; refer to **Table 5** for a list of ELC communities identified in the focal study area, within and surrounding the west end of the Technically Preferred Alternative study area. **Table 5** also indicates TRCA L-Ranks of each community identified. Refer to **APPENDIX E** for ELC mapping of the focal study area.

A total of 137 plant species were recorded by MH within the focal study area, of which just over 20% (28 species) were considered species of Conservation Concern by the TRCA; refer to **APPENDIX D** for these species. In addition, three (3) Butternuts, a species listed as Endangered and protected under the Endangered Species Act (ESA) 2007, were recorded in the focal study area in Year 2. One (1) of the three (3) Butternuts, which was located west of the east end of the existing section of Teston Road and west of Dufferin Street (a sapling), was determined in Year 3 to have been removed as a result of tree clearing within a Rural Property (CVR-4) that had been completed as part of an unrelated project. The other two (2) Butternuts (both larger trees) were not located within the Technically Preferred Alternative study area limits in Year 3 after they were documented in Year 2, therefore, the status of these two (2) trees has not been ascertained since Year 2.

In Year 2, Black Ash (*Fraxinus nigra*) was recorded in the focal study area near BBS #13, within the White Cedar – Conifer Mineral Coniferous Swamp (SWC1-2) community. Although Black Ash was not noted in the Technically Preferred Alternative study area in Year 3, this same ELC community (SWC1-2) providing confirmed suitable habitat for Black Ash extends into the

Technically Preferred Alternative limits. At the time it was observed in Year 2, Black Ash was not listed under the ESA. However, as of January 26, 2022, in Year 3, Black Ash was listed as Endangered under the ESA.

Table 5: ELC Communities within the Focal Study Area

ELC Code	Community Name	L Rank	Present in Technically Preferred Alternative Study Area (Y/N)?
Cultural	**Communities: Constructed Areas**		
CGL*	Constructed Green Lands	N/A	Y
CVC*	Commercial & Institutional	N/A	Y
CVI*	Transportation & Utilities	N/A	Y
CVR*	Residential	N/A	Y
CVR-2*	High-Density Residential	N/A	Y
CVR-3*	Single Family Residential	N/A	Y
CVR-4*	Rural Property	N/A	Y
Open	**Meadow or Barren Communities: Tree and**	**Shrub**	**<25%**
OAGM1*	Annual Row Crop	N/A	Y
CUM1-A	Native Forb Meadow	L5	Y
CUM1-B	Cool-Season Grass Graminoid Meadow	L+	Y
CUM1-C	Exotic Forb Old Field Meadow	L+	Y
SBO1-A	Dropseed Open Sand Barren	L2	N
SBO1-B	Flat-stemmed Bluegrass - Forb Open Sand Barren	L2	N
Treed	**Cultural Communities: >25% and <60%**	**Treed**	
CUP1-4	Hybrid Poplar Deciduous Plantation	L+	Y
CUP1-A	Restoration Deciduous Plantation	L5	N
CUP1-B	Willow Deciduous Plantation	L+	N
CUP2-A	Restoration Mixed Plantation	L5	N
CUP2-f	Hybrid Poplar - Conifer Mixed Plantation	L+	Y
CUP3-8	White Spruce - European Larch Coniferous Plantation	L5	N
CUP3-H	Mixed Conifer Coniferous Plantation	L5	Y
CUT1-1	Sumac Deciduous Thicket	L5	N
CUW1-A	Native Cultural Woodland	L5	Y
CUW1-A2	White Pine Successional Woodland	L4	N

ELC Code	Community Name	L Rank	Present in Technically Preferred Alternative Study Area (Y/N)?
Forested Communities: >60% Treed			
FOC1-2	Dry-Fresh White Pine (- Red Pine) Coniferous Forest	L3	N
FOC3-1	Fresh-Moist Hemlock Coniferous Forest	L4	Y
FOC3-A	Fresh-Moist Hemlock - White Pine Coniferous Forest	L3	Y
FOD2-4	Dry-Fresh Oak - Hardwood Deciduous Forest	L4	N
FOD3-1	Dry-Fresh Poplar Deciduous Forest	L3	Y
FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest	L5	N
FOD5-10	Dry-Fresh Sugar Maple - Paper Birch - Poplar Deciduous Forest	L4	N
FOD5-2	Dry-Fresh Sugar Maple - Beech Deciduous Forest	L5	N
FOD8-1	Fresh-Moist Poplar Deciduous Forest	L5	Y
FOM3-1	Dry-Fresh Hardwood - Hemlock Mixed Forest	L3	Y
FOM3-2	Dry-Fresh Hemlock - Sugar Maple Mixed Forest	L4	N
FOM5-1	Dry-Fresh Paper Birch Mixed Forest	L3	N
Wetland	**Communities: Seasonally or Permanently**	**Saturated**	
MAM2-a	Common Reed Mineral Meadow Marsh	L+	N
MAM2-10	Forb Mineral Meadow Marsh	L4	N
MAM2-9	Jewelweed Mineral Meadow Marsh	L4	Y
SAF1-3	Duckweed Floating-leaved Shallow Aquatic	L4	Y
SWC1-1	White Cedar Mineral Coniferous Swamp	L4	Y
SWC1-2	White Cedar - Conifer Mineral Coniferous Swamp	L3	Y
SWD4-3	Paper Birch - Poplar Mineral Deciduous Swamp	L4	N
SWT2-5	Red Osier Dogwood Mineral Thicket Swamp	L4	N
OA*	Open Water	N/A	N

* Indicates that 2008 ELC was used for this community. A shaded row indicates that the community is a community of Regional Conservation Concern (L1-L3) or is of Conservation Concern in Urban Areas (L4). A non-shaded row indicates that the community is not of conservation concern at this time (L5), is not native to or naturally occurring within the TRCA (L+) or is a cultural community that is not ranked by the TRCA (N/A).

A total of 20 different ELC communities were confirmed within and adjacent to the limits of the anticipated widening of the existing Teston Road, between Dufferin Street in the west and

Bathurst Street in the east, as shown in **Table 6**; refer to **APPENDIX E** for mapping of ELC completed for this area in Year 3. Very few (2/20) of the communities identified along the Teston Road widening limits, between Dufferin Street and Bathurst Street, were considered communities of Conservation Concern by the TRCA.

Table 6: ELC Communities Along Teston Road between Dufferin Street and Bathurst Street

ELC Code	Community Name	L Rank
Cultural	**Communities: Constructed Areas**	
CGL*	Constructed Green Lands	N/A
CVC*	Commercial & Institutional	N/A
CVI*	Transportation & Utilities	N/A
CVR-1*	Low Density Residential	N/A
CVR-3*	Single Family Residential	N/A
Open Meadow or	**Barren Communities: Tree and Shrub <25%**	
OAGM1*	Annual Row Crop	N/A
CUM1-A	Native Forb Meadow	L5
CUM1-B	Exotic Cool Season Grass Graminoid Meadow	L+
CUM1-C	Exotic Forb Old Field Meadow	L+
CUH1-A	Treed Hedgerow	L5
Treed Cultural	**Communities: >25% and <60% Treed**	
CUP1-4	Hybrid Poplar Deciduous Plantation	L+
CUP3-2	White Pine Coniferous Plantation	L5
CUP2-f	Hybrid Poplar - Conifer Mixed Plantation	L+
CUP3-H	Mixed Conifer Coniferous Plantation	L5
CUW1-A	Native Cultural Woodland	L5
CUW1-A1	White Cedar Cultural Woodland	L4
CUW1-A3	Native Deciduous Cultural Woodland	L5
CUW1-B	Exotic Cultural Woodland	L+
Forested	**Communities: >60% Treed**	
FOMA-A	Fresh-Moist White Pine - Sugar Maple Mixed Forest	L3
Wetland	**Communities: Seasonally or Permanently**	**Saturated**
MAS2-1B	Narrow-leaved Cattail Mineral Shallow Marsh	L5

* Indicates that 2008 ELC was used for this community. A shaded row indicates that the community is a community of Regional Conservation Concern (L1-L3) or is of Conservation Concern in Urban Areas

(L4). A non-shaded row indicates that the community is not of conservation concern at this time (L5), is not native to or naturally occurring within the TRCA (L+) or is a cultural community that is not ranked by the TRCA (N/A).

Within the Technically Preferred Alternative study area, one (1) new plant species which had not been previously observed, was documented. Numerous Kentucky Coffee-trees (*Gymnocladus dioicus*) a species previously listed as Threatened under the ESA, were noted along the existing sections of Teston Road, west of Keele Street and east of Dufferin Street. However, as of January 25, 2023, this species was reclassified under the ESA as not at risk throughout most of Ontario (aside from within its natural growing range in select jurisdictions in southern Ontario). Therefore, this species no longer receives species and habitat protection under the ESA within York Region. It is also noted that all Kentucky Coffee-trees observed were obviously planted as ornamental specimens (e.g., support stakes, mulching, trunk protection, etc. observed).

No additional SAR vegetation besides Black Ash and Butternut, such as American Ginseng, have been observed at any time during field investigations.

Two (2) invasive plant species were recorded on site within the Technically Preferred Alternative limits that are regulated and restricted in Ontario under Invasive Species Act Regulations – Ontario Regulation (O. Reg.) 354/16, including Common Reed and Japanese Knotweed (*Reynoutria japonica*). Goutweed (*Aegopodium podagraria*), a species which is not regulated but similarly invasive, has also been recorded; refer to **APPENDIX D**. These species have the capability of dominating other vegetation in an area, resulting in significantly reduced biodiversity.

4.2.3 Rare and Species at Risk Wildlife

Ontario's ESA provides protection for species listed as Endangered or Threatened on the Species at Risk in Ontario list, as determined by COSSARO, as well as protection of the habitat of Endangered and Threatened species. The SAR in Ontario list also identifies species of Special Concern, defined as wildlife species that may become Threatened or Endangered because of a combination of biological characteristics and identified threats. Species of Special Concern and their habitats are not protected under the ESA, though are also included in discussion of SAR.

Species are also assigned an L Rank by the TRCA to identify species of regional conservation concern, which are targeted for conservation in the Toronto area, though they do not receive protection, aside from protection of nests, eggs, and individuals that most birds receive under either the Migratory Birds Convention Act (MBCA) or the Fish and Wildlife Conservation Act (FWCA). An L Rank of L1-L3 indicates a species of Regional Conservation Concern (L3 being less so than L2 or L1), L4 indicates a species of Conservation Concern in Urban Areas, and L5 indicates a species is secure throughout the region.

During the background screening 25 terrestrial SAR wildlife were identified as being previously being recorded in the area surrounding the Technically Preferred Alternative, a number of which have potential or confirmed habitats in the Technically Preferred Alternative limits. **Table 7** lists the SAR wildlife that were identified during the background screening as being previously recorded in the vicinity, identifies those with confirmed and potential habitat in the Technically Preferred Alternative study area, and provides a description of suitable habitat that exists in the Technically Preferred Alternative study area for each species. **APPENDIX F** provides a detailed

description of each SARs habitat requirements, and an assessment of suitable habitat for each species. Further details on SAR observations and locations in the project area, are included within this section.

Table 7: Wildlife SAR and SAR Habitat Summary

Common Name	Scientific Name	ESA 2007 Status	Observed during Year 1-3 Field Investigations (Y/N)?	Potential to Occur in Technically Preferred Alternative Study Area (Y/N)?	Description of Habitat within Technically Preferred Alternative Study Area
Jefferson Salamander	*Ambystoma jeffersonianum*	Endangered	No	No	None
Acadian Flycatcher	*Empidonax virescens*	Endangered	No	No	None
Bank Swallow	*Riparia riparia*	Threatened	No	Yes; during construction only	None However, construction activities can create habitat.
Barn Swallow	*Hirundo rustica*	Special Concern	Yes	Yes; confirmed	Confirmed foraging in wetlands [Jewelweed Mineral Meadow Marsh (MAM2-9), Narrow-leaved Cattail Mineral Shallow Marsh (MAS2-1B), Duckweed Floating-leaved Shallow Aquatic (SAF1-3)] and open meadows [Native Forb Meadow (CUM1-A)]. Potential nesting structures present, though no nesting observed.
Bobolink	*Dolichonyx oryzivorus*	Threatened	Yes	Yes; confirmed	Confirmed breeding within open meadow [Native Forb Meadow (CUM1-A)] communities.
Canada Warbler	*Cardellina canadensis*	Special Concern	No	No	None
Cerulean Warbler	*Setophaga cerulea*	Threatened	No	No	None
Chimney Swift	*Chaetura pelagica*	Threatened	No	No	None
Common Nighthawk	*Chordeiles minor*	Special Concern	No	No	None
Eastern Meadowlark	*Sturnella magna*	Threatened	Yes	Yes; confirmed	Confirmed breeding within open meadow [Native Forb Meadow (CUM1-A)] communities.
Eastern Wood-Pewee	*Contopus virens*	Special Concern	Yes	Yes; confirmed	Confirmed breeding and potential habitat within numerous treed and forest communities [Hybrid Poplar - Conifer Mixed Plantation (CUP2-f), White Pine Coniferous Plantation (CUP3-2), Mixed Conifer Coniferous Plantation (CUP3-H), Native Cultural Woodland (CUW1-A), Native Deciduous Cultural Woodland (CUW1-A3), Fresh-Moist Hemlock Coniferous Forest (FOC3-1), Fresh-Moist Hemlock – White Pine Coniferous Forest (FOC3-A), Fresh-Moist Poplar Deciduous Forest (FOD8-1), Dry-Fresh Poplar Deciduous Forest (FOD3-1), Dry-Fresh Hardwood – Hemlock Mixed Forest (FOM3-1), Fresh-Moist White Pine – Sugar Maple Mixed Forest (FOMA-A)].
Evening Grosbeak	*Coccothraustes vespertinus*	Special Concern	No	No	None
Golden Winged Warbler	*Vermivora chrysoptera*	Special Concern	No	No	None
Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern	No	Yes	This species is not currently present, though there is suitable habitat for this species within the same open meadow [Native Forb Meadow (CUM1-A)] communities as Eastern Meadowlark and/or Bobolink.
Least Bittern	*Ixobrychus exilis*	Threatened	No	No	None
Red Headed Woodpecker	*Melanerpes erythrocephalus*	Endangered	No	No	None
Wood Thrush	*Hylocichla mustelina*	Special Concern	Yes	Yes; confirmed	Confirmed breeding and potential habitat within numerous treed and forest communities [Native Cultural Woodland (CUW1-A), Native Deciduous Cultural Woodland (CUW1-A3), Fresh-Moist Poplar Deciduous Forest (FOD8-1), Dry-Fresh Poplar Deciduous Forest (FOD3-1), Dry-Fresh Hardwood – Hemlock Mixed Forest (FOM3-1), Fresh-Moist White Pine – Sugar Maple Mixed Forest (FOMA-A)].
Monarch	*Danaus plexippus*	Special Concern	Yes	Yes; confirmed	Confirmed present and to have potential for breeding within open meadow [Native Forb Meadow (CUM1-A)] communities. Nectaring habitat is also present wherever there are flowering plants.

Common Name	Scientific Name	ESA 2007 Status	Observed during Year 1-3 Field Investigations (Y/N)?	Potential to Occur in Technically Preferred Alternative Study Area (Y/N)?	Description of Habitat within Technically Preferred Alternative Study Area
Eastern Small-footed Myotis	*Myotis leibii*	Endangered	No	Yes	There are confirmed suitable maternity roosting trees within treed and forest communities, where potential maternity roost trees were documented.
Little Brown Myotis	*Myotis lucifugus*	Endangered	No	Yes	There are confirmed suitable maternity roosting trees within treed and forest communities where potential maternity roost trees were documented.
Northern Myotis	*Myotis septentrionalis*	Endangered	No	Yes	There are confirmed suitable maternity roosting trees within treed and forest communities where potential maternity roost trees were documented.
Tri-colored Bat	*Perimyotis subflavus*	Endangered	No	Yes	There are confirmed suitable maternity roosting trees within treed and forest communities where potential maternity roost trees were documented.
Blanding's Turtle	*Emydoidea blandingii*	Endangered	No	Yes	This species is not highly detectable without targeted surveys. This species has not been observed on site. However, there is suitable habitat for this species in wetland [Jewelweed Mineral Meadow Marsh (MAM2-9), Narrow-leaved Cattail Mineral Shallow Marsh (MAS2-1B), Duckweed Floating-leaved Shallow Aquatic (SAF1-3)] and swamp [White Cedar - Conifer Mineral Coniferous Swamp (SWC1-2)] communities and in adjacent upland habitats.
Eastern Ribbonsnake	*Thamnophis sauritus*	Special Concern	No	Yes	This species is not highly detectable without targeted surveys. This species has not been observed on site. However, there is suitable habitat for this species in throughout the site, in all wetland, treed, and forest communities.
Snapping Turtle	*Chelydra serpentina*	Special Concern	Yes	Yes; confirmed	This species has been confirmed and there is suitable year-round habitat for this species in wetland [Jewelweed Mineral Meadow Marsh (MAM2-9), Narrow-leaved Cattail Mineral Shallow Marsh (MAS2-1B), Duckweed Floating-leaved Shallow Aquatic (SAF1-3)] and swamp [White Cedar - Conifer Mineral Coniferous Swamp (SWC1-2)] communities and in adjacent upland habitats.

Over the course of the field investigations in all years, 73 species of birds, eight (8) species of mammals, eight (8) species of herpetofauna, and 10 species or family groups of invertebrates have been observed (**APPENDIX D**). Of these, the majority are ranked by the TRCA as species of conservation concern, and have potential to occur within or adjacent to the Technically Preferred Alternative limits. Within the focal and Technically Preferred Alternative study areas, 39 of the 65 birds observed, three (3) of six (6) mammals, and five (5) of five (5) herptiles were ranked as species of Regional Conservation Concern (L1-L3) or L4 by the TRCA; refer to **Table 8**. In general, the wildlife species observed represented a high diversity of wildlife and wildlife habitats present in the area.

Table 8: Wildlife Observed in Focal and Technically Preferred Alternative Study Areas

Common Name	Scientific Name	L-rank	ESA 2007 Status
Birds			
House Sparrow	*Passer domesticus*	L+	
American Woodcock	*Scolopax minor*	L3	
Bobolink	*Dolichonyx oryzivorus*	L3	Threatened
Clay-coloured Sparrow	*Spizella pallida*	L3	
Eastern Meadowlark	*Sturnella magna*	L3	Threatened
Eastern Towhee	*Piplio erythrophthalmus*	L3	
Great Blue Heron	*Ardea herodias*	L3	
Horned Lark	*Eremophila alpestris*	L3	
Magnolia Warbler	*Setophaga magnolia*	L3	
Mourning Warbler	*Geothlypis philadelphia*	L3	
Osprey	*Pandion haliaetus*	L3	
Pileated Woodpecker	*Dryocopus pileatus*	L3	
Scarlet Tanager	*Piranga olivacea*	L3	
Vesper Sparrow	*Pooecetes gramineus*	L3	
Wild Turkey	*Meleagris gallopavo*	L3	
Winter Wren	*Troglodytes hiemalis*	L3	
American Kestrel	*Falco sparverius*	L4	
American Redstart	*Setophaga ruticilla*	L4	
Barn Swallow	*Hirundo rustica*	L4	Special Concern
Common Yellowthroat	*Geothlypis trichas*	L4	
Eastern Kingbird	*Tyrannus tyrannus*	L4	
Eastern Wood-pewee	*Contopus virens*	L4	Special Concern
Field Sparrow	*Spizella pusilla*	L4	
Gray Catbird	*Dumetella carolinensis*	L4	
Great Crested Flycatcher	*Myiarchus crinitus*	L4	

Common Name	Scientific Name	L-rank	ESA 2007 Status
Hairy Woodpecker	*Picoides villosus*	L4	
Indigo Bunting	*Passerina cyanea*	L4	
Killdeer	*Charadrius vociferus*	L4	
Least Flycatcher	*Empidonax minimus*	L4	
Northern Flicker	*Colaptes auratus*	L4	
Northern Mockingbird	*Mimus polyglottos*	L4	
Pine Warbler	*Setophaga pinus*	L4	
Red-eyed Vireo	*Vireo olivaceus*	L4	
Ring-billed Gull	*Larus delawarensis*	L4	
Savannah Sparrow	*Passerculus sandwichensis*	L4	
Swamp Sparrow	*Melospiza georgiana*	L4	
Tree Swallow	*Tachycineta bicolor*	L4	
White-breasted Nuthatch	*Sitta carolinensis*	L4	
Willow Flycatcher	*Empidonax traillii*	L4	
American Crow	*Corvus brachyrhynchos*	L5	
American Goldfinch	*Spinus tristis*	L5	
American Robin	*Turdus migratorius*	L5	
Baltimore Oriole	*Icterus galbula*	L5	
Black-capped Chickadee	*Poecile atricapillus*	L5	
Blue Jay	*Cyanocitta cristata*	L5	
Brown-headed Cowbird	*Molothrus ater*	L5	
Cedar Waxwing	*Bombycilla cedrorum*	L5	
Chipping Sparrow	*Spizella passerina*	L5	
Common Grackle	*Quiscalus quiscula*	L5	
Downy Woodpecker	*Picoides pubescens*	L5	
House Wren	*Troglodytes aedon*	L5	
Mallard	*Anas platyrhynchos*	L5	
Mourning Dove	*Zenaida macroura*	L5	
Northern Cardinal	*Cardinalis cardinalis*	L5	
Orchard Oriole	*Icterus spurius*	L5	
Red-bellied Woodpecker	*Melanerpes carolinus*	L5	
Red-breasted Nuthatch	*Sitta canadensis*	L5	
Red-tailed Hawk	*Buteo jamaicensis*	L5	
Red-winged Blackbird	*Agelaius phoeniceus*	L5	
Song Sparrow	*Melospiza melodia*	L5	

Common Name	Scientific Name	L-rank	ESA 2007 Status
Turkey Vulture	*Cathartes aura*	L5	
Warbling Vireo	*Vireo gilvus*	L5	
Yellow Warbler	*Setophaga petechia*	L5	
Swainson's Thrush	*Catharus ustulatus*	Not listed	
Gull sp.	*Larus* sp.	N/A	
Wood Thrush	*Hylocichla mustelina*	L3	Special Concern
Herptiles			
Spring Peeper	*Pseudacris crucifer*	L2	
Midland Painted Turtle	*Chrysemys picta marginata*	L3	
American Toad	*Anaxyrus americanus*	L4	
Green Frog	*Lithobates clamitans*	L4	
Eastern Gartersnake	*Thamnophis sirtalis sirtalis*	L4	
Mammals			
Eastern Chipmunk	*Tamias striatus*	L4	
Eastern Cottontail	*Sylvilagus floridanus*	L4	
White-tailed Deer	*Odocoileus virginianus*	L4	
Eastern Gray Squirrel	*Sciurus carolinensis*	L5	
Striped Skunk	*Mephitis mephitis*	L5	
Raccoon	*Procyon lotor*	L5	
Invertebrates			
Black Swallowtail	*Papilio polyxenes*	N/A	
Bluet sp.	*Enallagma sp*	N/A	
Brush-footed Butterflies	*Nymphalidae*	N/A	
Cabbage White	*Pieris rapae*	N/A	
Common European Amber Snail	*Succinea putris*	N/A	
Litter Moths	*Zanclognatha sp.*	N/A	
Monarch	*Danaus plexippus*	N/A	Special Concern
Narrow-winged Damselflies	*Coenagrionidae*	N/A	
Silvery Blue	*Glaucopsyche lygdamus*	N/A	
Stink Bugs	*Pentatomidae*	N/A	

Over the course of the terrestrial field surveys, five (5) of the wildlife species observed within or proximal to the Technically Preferred Alternative limits are listed as Special Concern under the ESA, including Barn Swallow, Eastern Wood-Pewee, Wood Thrush, Snapping Turtle, and Monarch. In addition, two (2) wildlife species observed are listed as Threatened under the ESA, including Bobolink, and Eastern Meadowlark. It should be noted that Barn Swallow was previously

listed as Threatened under the ESA, at the time of the Year 2 surveys, however, it has since been re-listed as Special Concern under the ESA in Ontario.

Barn Swallows were observed foraging at five (5) breeding bird survey locations (BBS 1, BBS 2, BBS 5, BBS 6, and BBS 17). Monarch, Eastern Meadowlark, and Bobolink were all observed within the Native Forb Meadow (CUM1-A) community present within the Vaughan landfill. It is also presumed that suitable habitat for these species is present in the City of Toronto's Keele Valley Landfill site to the south, based on conditions observed across the property line. Bobolinks were recorded at four (4) breeding bird survey locations (BBS 2, BBS 4, BBS 5, and BBS 6), and Eastern Meadowlarks were recorded at six (6) breeding bird survey locations (BBS1 through to BBS 6). Eastern Wood-Pewee and Wood Thrush were observed within several of the forested communities in the tract of forest north and west of Dufferin Street alongside the East Don River (BBS 3, BBS 7, BBS 9, BBS 12, BBS 13, BBS 14, and BBS 17 for Eastern Wood-Pewee and BBS 7 and BBS 14 for Wood Thrush). Snapping Turtle was observed basking in open water within a Duckweed Floating-leaved Shallow Aquatic (SAF1-3) community at BBS 10, and Barn Swallows were observed foraging over open water at two (2) locations: north of Teston Road and west of Dufferin Street, and east of Dufferin Street and south of Teston Road.

No additional rare or SAR wildlife were observed during the field surveys (refer to **APPENDIX D**). No bird nests were observed within culverts inspected within the Technically Preferred Alternative study area, and no suitable structures for Barn Swallow or Chimney Swift nesting aside from the inspected culverts were identified within the Technically Preferred Alternative study area. During the numerous surveys completed by MH in spring in Year 3, no vernal or ephemeral pools were observed within the forested communities contained within the within the Technically Preferred Alternative limits. Therefore, these specialized habitat features for salamanders, including Jefferson Salamanders (a species listed as endangered under the ESA), were confirmed to be absent.

Aside from SAR, an additional noteworthy wildlife observation was two (2) Eastern Gartersnakes (*Thamnophis sirtalis sirtalis*) basking together in early spring along a pathway running east to west within the Dry-Fresh Hardwood – Hemlock Mixed Forest (FOM3-1) community located directly east of the Vaughan and City of Toronto landfills, within the Technically Preferred Alternative limits. Given the time of year that these snakes were observed and the suitability of the surrounding habitat features (rocky slope with sun exposure) it is likely that a potential hibernaculum for snakes was located in the vicinity of this observation. However, confirmation of more than five (5) individuals of the same species of snake are required to meet the threshold of Significant Wildlife Habitat (SWH) - Reptile Hibernaculum, per the criteria within this region (i.e., Ecoregion 6E); refer to **Section 4.2.4** for further discussion on SWH.

Based on the Year 2 field surveys, which included an initial assessment of habitat for SAR bats, almost all of the forest and woodland communities located within the focal study area met the criteria to be considered suitable maternity roost habitat for SAR bats under Phase I: Bat Habitat Suitability Assessment of The Protocol, aside from several small and immature Willow Deciduous Plantation (CUP1-B) and Restoration Deciduous Plantation (CUP1-A) communities located within the Vaughan landfill. Therefore, the majority of forest and woodland communities were deemed to warrant more detailed, Phase II: Identification of Suitable Maternity Roost Trees surveys for

SAR bat habitat in Year 3, using The Protocol. Following Phase II: Identification of Suitable Maternity Roost Trees of The Protocol in Year 2, bat maternity roost tree surveys were completed in Year 3, and a total of 86 potential maternity trees were identified during the surveys; refer to **Figure 6** for the locations of all potential maternity roost trees identified. Many of the trees identified exhibit one (1) or more characteristics that would make them of higher quality for bats, such as cavities, cracks, or crevices higher than 10 m, being located in close proximity to other potential roost trees, having 25 cm or greater DBH, and being in earlier stages of decay. Based on the results of the Phase II: Identification of Suitable Maternity Roost Trees surveys, the treed communities adjacent to the existing sections of Teston Road contained very few potential maternity roost trees, and were therefore less suitable for bat roosting, whereas all of the treed communities located in between the existing sections of Teston Road were of higher suitability for bats, containing a much higher density of potential maternity roost trees (**Figure 6**).

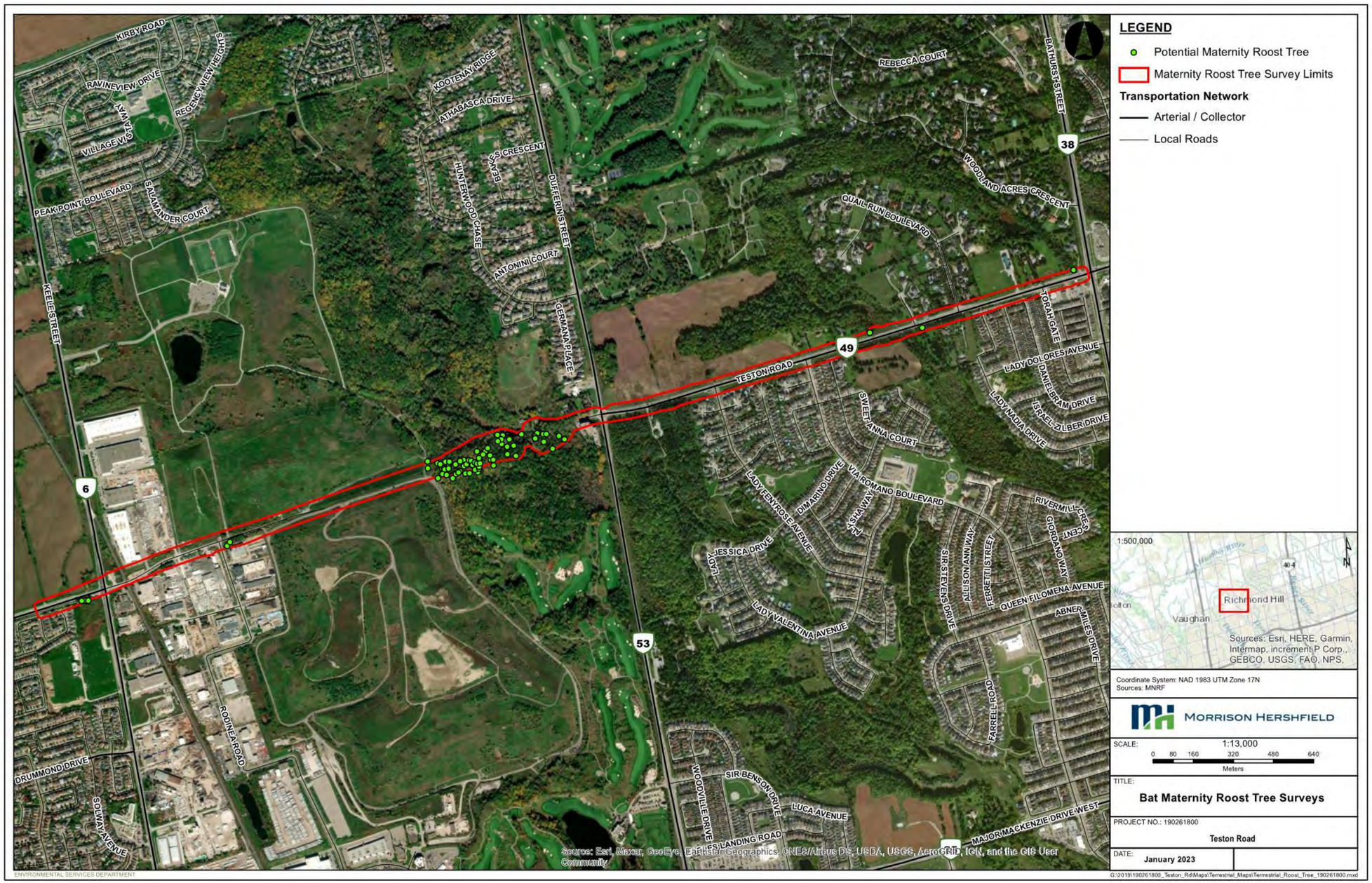

Figure 6: Potential Maternity Roost Trees for Bats Identified in Year 3

4.2.4 Significant Wildlife Habitat

A number of potential and confirmed SWH types have been identified in proximity to the proposed project, particularly within the Technically Preferred Alternative study area, where the project impacts are proposed (refer to **Section 5.2.4** for discussion on impacted SWH). **APPENDIX G** includes a detailed assessment of SWH presence and absence within the Technically Preferred Alternative study area.

The project area is located within Ecoregion 6E. There are four (4) categories of provincially SWH within Ecoregion 6E according to the Significant Wildlife Habitat Technical Guide (MNRF, 2000) and the Significant Wildlife Habitat Eco-Regional Criterion Schedule for Ecoregion 6E (MNRF, 2015), including:

1. Seasonal Concentration Areas of Animals.
2. Rare Vegetation Communities or Specialized Habitat for Wildlife.
3. Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species).
4. Animal Movement Corridors.

Significant Wildlife Habitat: Seasonal Concentration Areas of Animals

Some species of animals gather together from geographically wide areas at certain times of the year. This could be to hibernate or to bask (e.g., some reptiles and bats), over-winter (e.g. deer yards), or to breed (e.g. Bullfrog breeding and nursery areas, bird breeding colonies). Maintenance of the habitat features that result in these concentrations can be critical in sustaining local or even regional populations of wildlife.

Based on the results of the field surveys completed, the habitat and ELC communities present, and site conditions observed, candidate (i.e., potential) Seasonal Concentration Areas of Animals identified included Shorebird Migratory Stopover Areas, a Raptor Wintering Area, Bat Maternity Colonies, Turtle Wintering Areas, Reptile Hibernacula, and Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs).

The shorelines of watercourses and wetlands present act as a Shorebird Migratory Stopover Area. The large tracts of forest and grassland present may act as a Raptor Wintering Area, and both Red-tailed Hawk and American Kestrel have been observed during the summer field surveys (**Table 8**) and also have the potential to be present during the winter. Numerous potential maternity roost trees for bats have been documented and, given the abundance and quality of available habitat present, it is likely that Bat Maternity Colonies are present. Wetlands and watercourses present may provide Turtle Wintering Areas, and both Snapping Turtles and Midland Painted Turtles have been observed in the area (**Table 8**). There may be numerous opportunities for Reptile Hibernacula in the area (e.g., rock piles or fissures, in wetlands) and as noted in **Section 4.2.3**, two (2) Eastern Gartersnakes were observed basking in early spring in the forest west of the East Don River, indicating that this SWH is present. Wetlands and forests in the area may potentially provide Colonially - Nesting Bird Breeding Habitat, particularly for Green Herons (*Butorides virescens*) and Great Blue Herons (*Ardea herodias*), the latter of which has been confirmed in the area (**Table 8**).

Significant Wildlife Habitat: Rare Vegetation Communities or Specialized Habitat for Wildlife

Rare Vegetation Communities often contain rare species, particularly plants, which depend on those habitats for survival and cannot readily move or find alternative habitats. There were no Rare Vegetation Communities identified within the study area. As a result of the field surveys, Rare Vegetation Communities were confirmed to be absent within the Technically Preferred Alternative study area.

Specialized Habitat for Wildlife can include old-growth forests, calving areas for moose, cliffs, and habitat for bird species requiring large blocks of habitat (generally greater than 25 ha in size). Based on the field survey results and the site conditions, several candidate Specialized Habitats for Wildlife were identified, including Waterfowl Nesting Areas, Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat, Woodland Raptor Nesting Habitat, Turtle Nesting Areas, Seeps and Springs, Amphibian Breeding Habitat (Woodlands), Amphibian Breeding Habitat (Wetlands), and Woodland Area Sensitive Breeding Bird Habitat.

Wetlands and surrounding upland areas proximal to the project may contain Waterfowl Nesting Areas, particularly for species such as Wood Duck and Mallards, as noted within *Provincially Significant East Don River Headwater Wetland Complex Summary* (GEM Services Inc., 2019). Osprey Nesting, Foraging, and Perching Habitat may be available, as nesting and foraging habitat is present in proximity to each other, and Ospreys were observed foraging over open water and wetlands along the East Don River during several site visits (**Table 8**). The continuous forest along the East Don River is large (>30ha) and includes interior habitat, therefore it may provide Woodland Raptor Nesting Habitat for several species. Lands adjacent to wetlands and watercourses have the potential to provide Turtle Nesting Areas. Both Snapping Turtles and Midland Painted Turtles have been observed during field surveys (**Table 8** and **APPENDIX D**), and a Midland Painted Turtle hatchling was previously observed adjacent to a Duckweed Floating-leaved Shallow Aquatic (SAF1- 3) community (north and west of Dufferin Street near BBS 15) indicating that turtle nesting does occur in the area, though the scale and extent of nesting activity is unknown and the threshold for this SWH could not be confirmed. Seeps have been recorded in headwater areas within the project limits, though the scale and extent of these features are unknown and the threshold for this SWH could not be confirmed. Wetland habitats with permanent water adjacent to woodlands are present and may provide Amphibian Breeding Habitat (Woodlands), and wetlands themselves may provide Amphibian Breeding Habitat (Wetlands). Several amphibian species have been recorded during field surveys that require these habitat types (**Table 8**). Interior forest habitat is present along the East Don River and several species indicating Woodland Area Sensitive Breeding Bird Habitat is present have been observed during the breeding season, including Red-breasted Nuthatch, Winter Wren, and Black-throated Green Warblers (**Table 8** and **APPENDIX D**), though the threshold for this SWH could not be confirmed.

Significant Wildlife Habitat: Habitat for Species of Conservation Concern

Rare wildlife status is based on species listed as Special Concern under the ESA, Global Rank (G-Rank) or Provincial Rank (S-rank) status, identified through the NHIC. The Significant Wildlife Habitat Technical Guide (MNRF, 2000) suggests that the highest priority for protection should be provided to habitats of the rarest species (on a scale of global through to local municipality); it

also states that habitats that support large populations of a species of concern should be considered significant.

Both confirmed and candidate Habitat for Species of Conservation Concern were identified based on the field survey results and the site conditions recorded, including Marsh Breeding Bird Habitat, Open Country Bird Breeding Habitat, and habitat for Special Concern and Rare Wildlife Species.

Marsh habitat is present in proximity to the project, and may provide Marsh Breeding Bird Habitat for several species, particularly Green Heron. Large Native Forb Meadow (CUM1-A) communities are present with Savannah Sparrow and Vesper Sparrow determined to be probable breeders in this community during breeding bird surveys (**Table 8**), therefore this SWH has been confirmed. Special Concern species observed to date with confirmed habitat in the project area include Barn Swallow, Wood Thrush, Eastern Wood-pewee, Monarch, and Snapping Turtle, therefore habitat for Special Concern and Rare Wildlife Species has been confirmed.

Significant Wildlife Habitat: Animal Movement Corridors

Animal Movement Corridors are elongated areas used by wildlife to move from one habitat to another. They are important to ensure genetic diversity in populations, to allow seasonal migration of animals (e.g., deer moving from summer to winter range) and to allow animals to move throughout their home range from feeding areas to cover areas. Animal Movement Corridors in Ecoregion 6E include Amphibian Movement Corridors and Deer Movement Corridors.

No confirmation of Animal Movement Corridors was obtained during the Year 1 surveys. However, potential Amphibian Movement Corridors were noted along the watercourses within the Year 1 study area, as there was interspersed open water and wetland habitats surrounded by naturalized vegetative communities, east of Keele Street from Kirby Road south to Major Mackenzie Drive. No confirmation of Animal Movement Corridors was obtained during the Year 2 surveys either. Potential White-tailed Deer (*Odocoileus virginianus*) movement corridors were identified between the Native Forb Meadow (CUM1-A) communities and the forest communities within the focal study area through evidence of deer observed (i.e., a deer trail, deer beds, deer tracks, and a deer foraging), which are likely locally significant to deer. However, the MNRF is responsible for identifying Deer Movement Corridors as provincially SWH areas and has not identified them in this area. In Year 2, potential Amphibian Movement Corridors and locally significant movement corridors for deer were also noted along the watercourses within the focal study area, where there are interspersed open water and wetland habitats surrounded by naturalized vegetative communities. In Year 3, the same potential movement corridors as in Year 2 were confirmed as being likely, due to continuing evidence of deer as well as persistence of similar site conditions.

As discussed in **Section 4.2.1**, *Inventory of the Life Science Maple Uplands & Kettle Wetlands and Earth Science Oak Ridges Moraine Maple Spur Areas of Natural and Scientific Interest, City Of Vaughan, Ontario* (MNRF, 2000) and *Provincially Significant East Don River Headwater Wetland Complex Summary* (GEM Services Inc., 2019) each note that river valleys such as the East Don River play essential roles in maintaining ecological functions by providing corridors that allow for the physical passage and genetic flow of animals and plants. The documents further indicate that there are known travel corridors along the East Don River between amphibian breeding wetlands and adjacent upland habitats, as well as movement corridors for wildlife along the forested East Don River valley corridor and its tributaries.

5. IMPACT ASSESSMENT

This intent of this impact assessment is to document the potential effects of the Technically Preferred Alternative to the terrestrial and aquatic features and functions within the limits of proposed work and the adjacent lands within 120 m. The preliminary design plans for the Technically Preferred Alternative consist of an extension of Teston Road between Keele Street and Dufferin Street along its current alignment, a 40 m bridge spanning the East Don River to the west of Dufferin Street and widening of the existing section of Teston Road between Dufferin Street and Bathurst Street. As the impacts have been assessed based on preliminary design information, impacts will need to be reassessed when detailed designs become available.

Given that the project is not anticipated to commence for some time, there is potential that classifications of species under SARO and regulations under the ESA may change. Further, habitat conditions on site are subject to change. As such, species' statuses and protections, as well as on-site conditions should be re-examined during subsequent phases of this project.

The existing environmental site conditions within the Technically Preferred Alternative and 120 m adjacent lands have been evaluated against the proposed project plans to assess potential direct and indirect impacts to terrestrial and aquatic habitat, which have been divided into three (3) types of impacts.

- Permanent loss areas include areas where vegetation and habitat cannot be reinstated in situ following work, and generally include all roads, pathways, and impermeable surfaces or structures.
- Negative impact areas are those requiring grading or excavation, though they can be revegetated and eventually provide habitat for wildlife, after time to re-establish.
- Harmful alteration areas essentially include areas underneath the proposed bridge, where, although some vegetation and habitat for fish and wildlife may remain available following the work, the habitat will vary from previous conditions and there will ultimately be limited opportunities for restoration, resulting in an overall reduction of habitat quality.

Figures illustrating the aquatic and terrestrial areas of impact associated with the Technically Preferred Alternative and can be found in **APPENDIX H**.

5.1 Aquatic Areas of Impact

Site 1 – Don River East Branch Located West of Dufferin Street

Impacts to the headwaters of the East Don River within the Teston Road extension between Keele Street and Dufferin Street are expected, as direct fish habitat will be permanently altered by the creation of the new road and the resulting bridge crossing the watercourse. As per the Federal Fisheries Act, the DFO Self-Screening process has been completed for the new Teston Road extension and as these works do not meet the criteria for the Clear Span Bridges DFO Code of Practice, they have been assessed using the Pathway of Effects (PoE) model. Refer to **APPENDIX I** for the Aquatic Effects Summary Tables completed using the PoE tables.

The planned construction of the Teston Road bridge over the Don River East Branch will result in both land and water-based impacts to the natural environment. Activities including vegetation

clearing, grading, excavation, use of industrial equipment, riparian planting, temporary change in flows, and temporary fish passage alterations, will likely result from the proposed works. Through the placement of the retaining walls and wingwalls, the bridge footprint will permanently impact 90 m^2 below the 2-year high water mark. The specific details of the placement of materials will be confirmed at a later design stage. The bridge deck will cover 225 m^2 of area over the 2-year high water mark, however it is expected that the natural channel form will be maintained throughout the width of the bridge, and acceptable light levels will be present.

Due to the level of impact associated with this crossing, and the potential for the work to result in Harmful Alteration, Disruption or Destruction (HADD) of fish and fish habitat, a Request for Review should be submitted to Fisheries and Oceans Canada (DFO) during the detailed design phase of the project. While impacts were assessed based on the available information, impacts will need to be reassessed when new design information becomes available.

Site 2 – Tributary of Don River East Branch, Culvert Crossing Teston Road West of Saul Court

Aquatic impacts between Dufferin Street and Bathurst Street are expected to be limited, however the future design of this culvert is likely to include the installation of wing walls at the culvert inlet and/or outlet. In-water work is likely to be needed for the installation of the wing walls. Although too early in the design process to assess impacts from this work, it will be the goal that all construction activities can be properly mitigated with no residual effects persisting following completion of the roadway expansion and wingwall construction. Redside Dace which are present within the watercourse downstream of Teston Road will be considered as a part of the wingwall design process and development of mitigation measures during the detailed design phase.

Site 3 – Tributary of East Don River, Culvert Crossing Teston Road at Bathurst Street

Aquatic impacts between Dufferin Street and Bathurst Street are expected to be limited as the roadway widening will not require widening or extension of the culvert at Site 3. No in-water work is expected, and all construction activities can be properly mitigated with no residual effects persisting following completion of the roadway expansion.

5.2 Terrestrial Areas of Impact

Existing Teston Road from West of Keele Street to Rodinea Road

From west of Keele Street to Rodinea Road, along the existing Teston Road, impacts to the terrestrial environment are expected to be minor. Work will involve the widening of Teston Road and associated infrastructure as well as improvements at the Keele Street and Teston Road intersection to facilitate the widening. This area is already relatively developed, and predominated by commercial, residential, and agricultural ELC communities and the area of impact is anticipated primarily within the existing Teston Road right-of-way (ROW); refer to **APPENDIX H**. Permanent loss areas include those within and immediately adjacent to the footprint of the road widening. Negative impact areas will include the grading limits and embankment areas, beyond the road widening, which can be re-planted.

Extension of Teston Road from Rodinea Road East to Dufferin Street

From Rodinea Road east to Dufferin Street, the impacts to the terrestrial environment are anticipated to be moderate to significant. Construction of the new section of Teston Road between the existing sections of Teston Road as well as construction of the 40 m span bridge over the East Don River will result in impacts within undisturbed natural and naturalized areas; refer to **APPENDIX H**.

Although minor gravel access roads exist within the landfills along the west end of the proposed alignment of the new Teston Road, from east of Rodinea Road to the forests adjacent to the East Don River, the limited and infrequent use of these roads do not appear to impact the quality or function of the adjacent habitat presently. Under current conditions, the naturalized Native Forb Meadow (CUM1-A) communities alongside the existing gravel roads were found to function as a grassland and provide confirmed habitat for grassland birds, including SAR Eastern Meadowlark and Bobolink, provide SWH for numerous species, and provide habitat and a likely movement corridor for mammals such as White-tailed Deer; refer to **Section 5.2.4** for discussion on impacts within SWH, and to **Section 5.2.3** for discussion on impacts to SAR habitat.

Within the forest and wetland communities along the east end of the proposed alignment of the new Teston Road, west of Dufferin Street, only small and discrete footpaths exist at this time, and habitat remains generally intact, including potential habitat for bats, habitat for several Special Concern species, SWH for numerous species, and habitat and likely movement corridors for mammals and herpetofauna. Furthermore, areas of Significant Forest, PSW, ANSI, and ORM Conservation Plan areas are within the area of impact associated with the new roadway; refer to **Section 5.2.1** for discussion on impacts within designated natural areas.

Permanent loss areas will include areas within and immediately adjacent to the footprint of the new roadway and bridge. Negative impact areas will include the grading limits and embankment and access areas, beyond the new road and bridge footprints, which can be re-planted. Harmful alteration areas will include areas underneath the span of the bridge, where restoration capacity will be limited.

Existing Teston Road from Dufferin Street to West of Bathurst Street

From Dufferin Street east to west of Bathurst Street along the existing Teston Road, impacts to the terrestrial environment are anticipated to be minor. Work will involve widening of Teston Road and associated infrastructure as well as improvements at the intersection of Bathurst Street and Teston Road. This area is already relatively developed, and predominated by commercial, residential, and agricultural ELC communities and the area of impact is anticipated primarily within the existing Teston Road ROW; refer to **APPENDIX H**. However, small sections of Significant Forest, unevaluated wetlands, and ORM Conservation Plan areas around the tributaries of The Don River East Branch, surrounding fisheries survey Site #2 and Site #3 will be within the area of impact associated with the widening; refer to **Section 5.2.1** for discussion on impacts within designated natural areas. Permanent loss areas include those within and immediately adjacent to the footprint of the road widening. Negative impact areas will include the grading limits and embankment areas, beyond the road widening, which can be re-planted.

5.2.1 Designated Natural Areas

The proposed work will occur within the limits of several designated natural areas as listed in **Table 4** (for the Technically Preferred Alternative study area), as described within **Section 5.2**, and as shown in **APPENDIX H**. **Table 9** below includes the anticipated areas of negative impact, permanent loss, and harmful alteration within each designated area, based on the preliminary designs.

Table 9: Areas of Impact within Designated Natural Areas.

Designated Natural Area	Area of Permanent Loss (m^2)	Area of Negative Impact (m^2)	Harmful Alteration (m^2)
Significant Forests	25,591	20,210	1,353
McGill Area Environmental Significant Area (ESA #73)	16,072	15,001	1,438
Maple Uplands and Kettles, Candidate Life Science ANSI	17,424	16,502	1,438
East Don River Headwater Wetland Complex (PSW)	1,294	486	1,205
Unevaluated Wetland	0	664	0
Oak Ridges Moraine Conservation Plan -Countryside Area	36,620	3,311	0
Oak Ridges Moraine Conservation Plan - Natural Core Area	23,102	16,158	1,438
Oak Ridges Moraine Conservation Plan - Natural Linkage Area	3,689	2,640	0
Oak Ridges Moraine Conservation Plan - Settlement Area	65,820	10,141	0

* It should be noted that while impacted areas are quantified per designated area, many of the designated areas overlap with one another, and thus impacts overlap. Therefore, totaling the impacts wouldn't be representative of the overall impacts.

Although the permanent impacts associated with the proposed work may appear relatively minor given the amount of available area as a whole, the severance and discontinuity of these designated natural areas by introducing a roadway into them are anticipated to affect the overall functions of these designated areas, particularly by constricting and restricting wildlife movement.

Life Science Maple Uplands & Kettle Wetlands and Earth Science Oak Ridges Moraine Maple Spur Areas of Natural and Scientific Interest

Within *Inventory of the Life Science Maple Uplands & Kettle Wetlands and Earth Science Oak Ridges Moraine Maple Spur Areas of Natural and Scientific Interest, City Of Vaughan, Ontario* (MNRF, 2000) it is recommended that no further development should occur in the ANSI, and that appropriate buffers from development be set aside to ensure that all ecological functions of the ANSI are maintained. It is also recommended that the corridor connecting the ANSI's forests and kettle wetlands to the East Don valley system be maintained, and strengthened, and that natural

corridors also be maintained and protected between the ANSI and the surrounding kettle wetlands to ensure wildlife passage is maintained. Since the proposed Teston Road project will result in development within the ANSI, permanent fragmentation and loss of natural corridors along the East Don River, and permanent restrictions to wildlife movement, these objectives within *Inventory of the Life Science Maple Uplands & Kettle Wetlands and Earth Science Oak Ridges Moraine Maple Spur Areas of Natural and Scientific Interest, City Of Vaughan, Ontario* (MNRF, 2000) will not be met, and the ecological function of the ANSI as a natural wildlife corridor conducive to wildlife movement may be permanently impaired.

Provincially Significant East Don River Headwater Wetland Complex

Within the *Provincially Significant East Don River Headwater Wetland Complex Summary* (GEM Services Inc., 2019) it is stated that major wetland functions need to be maintained at the East Don River Headwater Wetland Complex, including: its diversity of wetlands, its diversity of species, its groundwater seeps, its association of wetlands and uplands, and its wildlife corridors. Wildlife corridors in the East Don wetlands need to be maintained, and strengthened, as studies have shown the importance of wildlife corridors in maintaining diversity and resiliency in an ecosystem. Since the proposed Teston Road project will result in permanent loss of PSW areas as well as permanent impairment and loss of wildlife corridors along the East Don River, and permanent restrictions to wildlife movement, this objective within *Provincially Significant East Don River Headwater Wetland Complex Summary* (GEM Services Inc., 2019) will not be met.

Oak Ridges Moraine

According to the *Oak Ridges Moraine Conservation Plan* (Ontario, 2017), Natural Core Areas protect those lands with the greatest concentrations of key natural heritage features which are critical to maintaining the integrity of the Moraine as a whole. Only existing uses, agricultural uses, and very restricted new resource management, low intensity recreational, home businesses, and infrastructure (such as new roadways) uses are allowed in these areas. Natural Linkage Areas protect critical natural and open space linkages between the Natural Core Areas and along rivers and streams. The only uses that are allowed within Natural Linkage Areas are those allowed in Natural Core Areas (i.e., existing uses, agricultural uses, and very restricted new resource management, low intensity recreational, home businesses, and infrastructure uses), plus some aggregate resource operations. Countryside Areas provide an agricultural and rural transition and buffer between the Natural Core Areas and Natural Linkage Areas and the urbanized Settlement Areas. Prime agricultural areas (as identified in the Agricultural System referred to in the Growth Plan for the Greater Golden Horseshoe and the Greenbelt Plan), as well as natural features are protected. Uses typically allowed in agricultural and other rural areas are allowed here to support agriculture and the rural economy. Existing public service facilities in Countryside Areas should be maintained and adapted to meet the needs of the community, where feasible. Policies on creating and developing new lots in Natural Core Areas, Natural Linkage Areas and Countryside Areas are very restrictive. ORM Settlement Areas reflect a range of existing communities planned by municipalities to reflect community needs and values. Urban uses and development (as set out in municipal official plans) are allowed within Settlement Areas.

Given that undertaking construction of the Technically Preferred Alternative will result in a permanent loss of 36,620 m^2 (3.66 ha) of ORM Countryside Area, 23,102 m^2 (2.31 ha) of ORM Natural Core Area, and 3,689 m^2 (0.37 ha) of ORM Natural Linkage Area, and result in harmful alteration to 1,438 m^2 (0.14 ha) of ORM Natural Core area as well as additional negative impacts in these ORM protected areas (**Table 9**), and long-term fragmentation of these areas, the project is not conducive to the objectives within the ORM Conservation Plan, such as maintaining the integrity of the ORM as a whole, maintaining natural and open space linkages, or maintaining buffers between Natural Core Areas and Natural Linkage Areas and the urbanized Settlement Areas. However, infrastructure, such as new roadways, is a permitted use within these lands, subject to demonstration of the need for the project and that there is no reasonable alternative, and contingent upon demonstration that the planning, design and construction practices adopted will keep any adverse effects on the ecological integrity of the Plan Area to a minimum, the design practices adopted will maintain, and where possible improve or restore, key ecological and recreational linkages, and that the long-term landscape management approaches adopted will maintain, and where possible improve or restore, the health, diversity, size and connectivity of the key natural heritage feature (Ontario, 2017). The IEA process will address these requirements.

5.2.2 Vegetation and Terrestrial Habitat

Based on the preliminary designs, it is anticipated that the proposed project will result in a total permanent loss of approximately 155,118 m^2 (15.51 ha). Of this, 59,565 m^2 will be within existing vegetation communities, while the remaining 95,553 m^2 will be within existing cultural communities and constructed areas. An additional negative impact of 33,896 m^2 (3.39 ha) will be required for construction. Of this, 25,405 m^2 will occur within existing vegetation communities, while the remaining 8,491 m^2 will be within existing cultural communities and constructed areas. Negative impacts within vegetation communities are more temporary, as these are areas where removal of vegetation and habitat will occur, but, following construction, vegetation can be replaced and re-establish. An additional 1,437 m^2 (0.14 ha) of vegetation will be within an area of harmful alteration, and this habitat will be impaired. As shown in **Table 10**, the majority of the project impacts are within already developed cultural communities/constructed areas versus within naturalized vegetation communities.

Table 10: Areas of Impact per ELC Community

ELC Classification	ELC Code	L-rank	Area of Permanent Loss (m^2)	Area of Negative Impact (m^2)	Area of Harmful Alteration (m^2)
Vegetation Communities					
Treed Hedgerow	CUH1-A	L5	315	293	0
Native Forb Meadow	CUM1-A	L5	33,808	2,662	0
Exotic Cool Season Grass	CUM1-B	L+	1,620	0	0
Exotic Forb Old Field Meadow	CUM1-C	L+	4,733	2,418	0
Hybrid Poplar Deciduous Plantation	CUP1-4	L+	5	0	0
White Pine Coniferous Plantation	CUP3-2	L5	72	0	0
Mixed Conifer Coniferous Plantation	CUP3-H	L5	73	466	0
Native Cultural Woodland	CUW1-A	L5	3,711	4,620	0
Native Deciduous Cultural Woodland	CUW1-A3	L5	253	1,235	0
Exotic Cultural Woodland	CUW1-B	L+	0	133	0
Fresh-Moist Hemlock Coniferous Forest	FOC3-1	L4	544	138	0
Fresh-Moist Hemlock – White Pine Coniferous Forest	FOC3-A	L3	0	1,528	0
Fresh-Moist Poplar Deciduous Forest	FOD8-1	L5	2,410	1,806	97
Dry-Fresh Poplar Deciduous Forest	FOD3-1	L3	5,476	5,506	0
Dry-Fresh Hardwood – Hemlock Mixed Forest	FOM3-1	L3	5,030	2,836	0
Fresh-Moist White Pine – Sugar Maple Mixed Forest	FOMA-A	L3	102	486	0
Jewelweed Mineral Meadow Marsh	MAM2-9	L4	1,065	54	823
Narrow-leaved Cattail Mineral Shallow Marsh	MAS2-1B	L5	149	1,224	0
Duckweed Floating-leaved Shallow Aquatic	SAF1-3	L4	23	0	52

ELC Classification	ELC Code	L-rank	Area of Permanent Loss (m^2)	Area of Negative Impact (m^2)	Area of Harmful Alteration (m^2)
White Cedar - Conifer Mineral Coniferous Swamp	SWC1-2	L3	176	0	465
		Total Area	**59,565**	**25,405**	**1,437**
Cultural Communities/Constructed Areas					
Constructed Green Lands	CGL	N/A	984	500	0
Commercial and Institutional	CVC	N/A	1,0816	945	0
Transportation and Utilities	CVI	N/A	62,259	950	0
Residential	CVR	N/A	2,755	395	0
Low Density Residential	CVR-1	N/A	3,493	1,634	0
High Density Residential	CVR-2	N/A	2,875	76	0
Single Family Residential	CVR-3	N/A	9,622	2,247	0
Rural Property	CVR-4	N/A	1,349	1,724	0
Annual Row Crop	OAGM1	N/A	1,400	20	0
		Total Area	**95,553**	**8,491**	**0**

In addition to physical removal of vegetation both permanently and temporarily, as shown in **Table 10** above, post-construction impacts to vegetated area along the new and widened Teston roadway may also include increases in run-off, soil erosion, sedimentation, and pollution such as excess salts. Increased edge impacts may also occur, such as an increased potential for introduction of invasive species into areas alongside the roadway. Although many of these impacts can be reduced through considerations within the design plans and/or mitigation and avoidance measures, they cannot be entirely prevented from increasing from current conditions (i.e., with no roadway present within the river valley and no widening along the existing sections of Teston Road).

5.2.3 Rare and Species at Risk Wildlife and Wildlife Habitat

As discussed within **Section 4.2.3**, the majority of wildlife observed are considered species of Conservation Concern by the TRCA, and numerous SAR were determined to be present, attesting to the high quality and diversity of habitat present for wildlife.

Both negative and permanent impacts to wildlife habitat will occur through vegetation clearing and habitat loss resulting from the project, as detailed in **Table 10**. Migratory and breeding birds will lose stopover, foraging and nesting habitat within vegetated areas being cleared permanently as well as in the interim in a larger area (i.e., negative impact areas) until planted areas can re-establish. Mammals will lose feeding and denning or roosting sites, and herpetofauna may lose hibernation and overwintering or breeding sites or lose freedom of movement between these important seasonal habitat types, both permanently and in the interim in a larger area (i.e., negative impact areas). Both mammals and herptiles will be susceptible to road mortality where they have not previously, due to construction of a new roadway throughout the existing intact and undisturbed forest and wetland tracts along the East Don River. Construction of the new roadway also introduces habitat fragmentation and reduces the connectivity of habitats, mainly for mammals and herpetofauna, by funneling wildlife to dedicated crossing points along the road, such as under the bridge or through a wildlife crossing. Both birds and mammals are also likely to experience permanent impacts associated with the new roadway as a result of loss of interior forest habitat, and newly introduced forest edge impacts, such as the increased potential for the introduction of invasive species.

In addition, the construction activities will generate nuisance effects in the surrounding area, such as heavy equipment traffic and increased noise, dust, and vibrations, which could adversely affect wildlife and migratory birds, though these impacts will be temporary. However, in the long term, all wildlife in the vicinity will experience some level of permanent disturbance post-construction due to newly introduced roadway noise, frequent human presence and increased human access, and artificial lighting into the area. Although many of these impacts can be reduced through considerations within the design plans and/or mitigation and avoidance measures, they cannot be entirely prevented from increasing from current conditions (i.e., with no roadway present within the river valley and no widening along the existing sections of Teston Road). However, despite the anticipated project impacts, it is anticipated that, given the scale of the proposed work, habitat for the majority of wildlife species detected will remain present, following completion of the project.

In terms of SAR, 17 were detected or were determined to have potential habitat in proximity to the project as detailed in **Table 7**. The provincial ESA, 2007, prohibits willful harm or harassment of Extirpated, Threatened, or Endangered species that are listed in regulations under the Act. The ESA also prohibits willful damage to, or destruction of their habitats. A discussion on impacts anticipated for each SAR follows.

Bank Swallow

Bank Swallow is listed as Threatened under the ESA. Neither Bank Swallows nor their habitat have been identified to date. However, there is the potential for this species to arrive on site following commencement of construction activities, as they are attracted to nesting in loose soils on exposed vertical faces, such as those resulting from construction of embankments, excavations, or stockpiles of soils. This species will not be impacted by the project, but creation of suitable habitat should be prevented during construction.

Barn Swallow

Barn Swallow is listed as Special Concern under the ESA. Barn Swallows have been observed foraging in nearby wetlands and in meadows extending into the project limits, though they have not been identified nesting within the proposed project limits. Construction of a new road and widening of the existing roads will result in a minimal loss of foraging habitat for this species. However, as Barn Swallows are aerial foragers and only use above-ground habitat for foraging, and since the majority of foraging habitat for this species will remain available following completion of the project, there will be no permanent impacts to foraging opportunities for this species. Currently, no impacts to nesting Barn Swallows are anticipated as a result of the proposed work, although there is potential for this species to commence nesting in existing suitable structures (i.e., culverts). In addition, the Teston Road project may in fact benefit Barn Swallows by introducing new structures into the area such as culverts and the proposed bridge over the East Don River, thus providing new nesting opportunities.

Bobolink, and Eastern Meadowlark

Bobolink and Eastern Meadowlark are listed as Threatened under the ESA. Bobolink and Eastern Meadowlark have been confirmed present and breeding within the native forb meadow (CUM1-A) communities within the landfills. While there are existing gravel roads and footpaths through the landfills, access is limited and the level of disturbance to nesting Bobolinks and Eastern Meadowlarks is currently low. This will no longer be the case after introduction of a major roadway into the area, and increased noise during and after construction may further reduce useable habitat for these species, by reducing the distance at which breeding calls can be heard (thereby reducing breeding success), and/or by increasing agitation of these birds during breeding. In addition, the creation of a multi-lane road through the middle of this habitat could potentially result in introduction of invasive species and/or non-grassland species during or following construction, resulting in a further loss of habitat for Bobolinks and Meadowlarks. Currently, despite a small permanent loss in area available for breeding, this loss of habitat is not anticipated to affect nesting Bobolinks or Eastern Meadowlark provided that large enough tracts of native forb meadow (CUM1-A) communities remain. However, under current legislation, actions for Bobolink and Eastern Meadowlark are required under the ESA due to the proposed impacts to habitat for these

species; refer to **Section 7** for discussion on future commitments for the project, including ESA requirements. Based on the preliminary designs, it is anticipated that the area of SAR grassland bird habitat (Native Forb Meadow – CUM1-A) impacted by the Technically Preferred Alternative will be 34,671 m^2 (3.47 ha), of which 32,383 m^2 (3.24 ha) will be permanent.

Grasshopper Sparrow

Although Grasshopper Sparrow (Special Concern under the ESA) has not been detected and is not currently present in proximity to the project, there is potential for this species to commence nesting at or near any of the locations where Bobolink and/or Eastern Meadowlark were observed.

Eastern Wood-Pewee and Wood Thrush

Eastern Wood-pewee and Wood Thrush are listed as Special Concern under the ESA. Eastern Wood-pewee and Wood Thrush have been confirmed present and breeding within several forested and treed communities along the East Don River. While there are existing footpaths through the forests, access is limited and the level of disturbance to Wood-Pewees and Wood Thrushes is currently very low. This will no longer be the case after introduction of a major roadway into the area, and increased noise during and after construction may further reduce useable habitat for these species, by reducing the distance at which breeding calls can be heard (thereby reducing breeding success), and/or by increasing agitation of these birds during breeding. In addition, the creation of a multi-lane road through the middle of this habitat could potentially result in introduction of invasive species and/or non-forest species during or following construction, resulting in a further loss of habitat for Eastern Wood-pewee and Wood Thrush. Currently, despite a small permanent loss in area available for breeding, this loss of habitat is not anticipated to affect nesting Eastern Wood-pewee or Wood Thrush provided that large enough tracts of forest communities remain. As these species are listed as Special Concern, no actions under the ESA are required for the proposed impacts on habitat for these species.

Monarch

Monarch is listed as Special Concern under the ESA. The native forb meadow (CUM1-A) communities have been found to provide suitable nectaring and breeding habitat for Monarchs, and Monarchs were observed within this community. Nectaring habitat is also present for Monarchs throughout the area, wherever flowering plants are present, such as in residential gardens, wetlands, etc. The proposed work will minimally reduce the amount of available nectaring and breeding habitat for this species. However, given the scale of the proposed work relative to the local abundance of breeding habitat (i.e., areas of Common Milkweed) and nectaring habitat (i.e., areas of flowering plants) the project is not anticipated to permanently impact this species. As Monarch is listed as Special Concern, no actions under the ESA are required for the proposed impacts on habitat for this species.

Butternut

Butternut is listed as Endangered under the ESA. To date, three (3) Butternuts have been documented in the vicinity of the project during field investigations. Of these, one (1) has been removed as a result of tree clearing for another project along the proposed alignment of Teston Road, west of Dufferin Street. The remaining two (2) are located within 120 m of the proposed

site plan. However, both of these Butternuts are located greater than 50 metres away from the proposed work, therefore no impacts to Butternuts or their habitat are anticipated as a result of the proposed project.

Black Ash

Black Ash has been previously recorded in the area, during the Year 2 surveys, within the white cedar – conifer mineral coniferous swamp (SWC1-2) community (near BBS 13). As of January 26, 2022, Black Ash was listed as Endangered under the ESA. No Black Ash trees are currently present within the proposed work limits, therefore no impacts to this species are anticipated as a result of the proposed project.

Bat Species at Risk

Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat are listed as Endangered under the ESA. As 86 potential maternity roost trees for bats have been documented within numerous treed and forest communities, as per Phase II: Identification of Suitable Maternity Roost Trees of The Protocol, there is potential suitable habitat for these species. Phase III: Acoustic Surveys of The Protocol have not been undertaken and so presence/absence of these species has not yet been assessed. However, based on the quality of the habitat identified, it is likely that one (1) species or more of SAR bats are present. Based on the current design, permanent impacts to SAR bats, if present, and their habitat will include clearing of treed and forest habitat resulting in a loss of roosting locations, fragmentation of what is currently a continuous tract of habitat and loss of interior habitat, potential introduction of invasive and/or non-forest species due to imposed edge impacts, and an increase in noise and disturbance, both during and after construction, which may further reduce useable habitat for bats if they are unable to forage or roost effectively in areas with increased noise and disturbance. If SAR bats are determined to be present, under current legislation, actions for these species would be required under the ESA due to the proposed impacts to their habitat; refer to **Section 7** for discussion on future commitments for the project, including ESA requirements.

Blanding's Turtle

Blanding's Turtles are listed as Threatened under the ESA. Although this species has not been confirmed, as they are not highly detectable and are highly mobile, there is potential for Blanding's Turtle to be present since suitable habitat is available along the East Don River, within wetlands, swamps, and adjacent upland areas for nesting and migration between seasonal habitat types. As this species is known to travel long distances over land to move between over wintering, summer, and nesting sites, construction of a roadway through a continuous tract of undisturbed habitat may create a barrier to Blanding's Turtle movement and introduce the threat of road mortality. If Blanding's Turtles are determined to be present, under current legislation, actions for this species would be required under the ESA due to the proposed impacts to habitat for this species; refer to **Section 7** for discussion on future commitments for the project, including ESA requirements.

Eastern Ribbonsnake

Eastern Ribbonsnake is listed as Special Concern under the ESA. Although this species has not been confirmed, as they are not highly detectable and are highly mobile, there is potential for Eastern Ribbonsnake to be present since suitable habitat is available within wetlands, treed habitats, and forest communities. Introduction of a major roadway (i.e., Teston Road) into the area would remove habitat for this species, fragment what is currently a continuous tract of habitat, introduce the threat of road mortality, and restrict movement of this species. As Eastern Ribbonsnake is listed as Special Concern, no actions under the ESA are required for the proposed impacts on habitat for this species.

Snapping Turtle

Snapping Turtles have been confirmed present in proximity to the project, and suitable habitat for this species exists along the East Don River within wetlands, swamps, and adjacent upland areas for nesting and migration between seasonal habitat types. As this species is known to travel long distances over land to move between over wintering, summer, and nesting sites, construction of a roadway through a continuous tract of undisturbed habitat will create a barrier to Snapping Turtle movement and introduce the threat of road mortality; this is the largest permanent impact to Snapping Turtles resulting from the proposed project although permanent impacts within wetland communities are also anticipated (**Table 10**). As Snapping Turtle is listed as Special Concern, no actions under the ESA are required for the proposed impacts on habitat for this species.

5.2.4 Significant Wildlife Habitat

As discussed within **Section 4.2.4**, the project area contains confirmed and potential provincially SWH for numerous species. A detailed assessment of SWH within the project area can be found in **APPENDIX G**. Based on this assessment, the following SWH types have been confirmed present or are candidate:

- Seasonal Concentration Areas of Animals
  - Shorebird Migratory Stopover Area (Candidate)
  - Raptor Wintering Area (Candidate)
  - Bat Maternity Colonies (Candidate)
  - Turtle Wintering Areas (Candidate)
  - Reptile Hibernaculum (Candidate)
  - Colonially-Nesting Bird Breeding Habitat (Trees/Shrubs) (Candidate)
- Specialized Habitat for Wildlife
  - Waterfowl Nesting Area (Candidate)
  - Bald Eagle and Osprey Nesting, Foraging and Perching Habitat (Candidate)
  - Woodland Raptor Nesting Habitat (Candidate)
  - Turtle Nesting Areas (Candidate)
  - Seeps and Springs (Candidate)
  - Amphibian Breeding Habitat (Woodlands) (Candidate)

    - Amphibian Breeding Habitat (Wetlands) (Candidate)
    - Woodland Area Sensitive Bird Breeding Habitat (Candidate)
- Habitats for Species of Conservation Concern
    - Marsh Breeding Bird Habitat (Candidate)
    - Open Country Bird Breeding Habitat (Confirmed)
    - Special Concern and Rare Wildlife Species (Confirmed)
- Animal Movement Corridors
    - Amphibian Movement Corridors (Candidate)

Based on the proposed project plans, it is anticipated that the majority of candidate and confirmed SWH identified will persist upon completion of the project, as most habitat types will remain available in the area in abundance and will remain accessible to wildlife. However, there are several exceptions where SWH may be permanently impacted, as described below.

Seasonal Concentration Areas of Animals – Reptile Hibernacula (Candidate)

Two (2) Eastern Gartersnakes were previously observed basking together along a pathway running east to west within the Dry-Fresh Hardwood – Hemlock Mixed Forest (FOM3-1) community located directly east of the Vaughan and City of Toronto landfills, east of Keele Street. Given the time of year that these snakes were observed and the suitability of the surrounding habitat features, it is likely that a potential hibernaculum for snakes was located in the vicinity of this observation, though the threshold required to meet the criteria of SWH was not reached. As the proposed alignment for the Teston Road extension will run directly through the location of this observation, if a hibernaculum is present in the vicinity, it may be directly and permanently impacted by construction of the roadway or may no longer be accessible to snakes as a result of the road.

Specialized Habitat for Wildlife – Woodland Raptor Nesting Habitat (Candidate)

Raptors require large tracts of forest with interior forest habitat (i.e., forest habitat > 200 m from a forest edge). As the proposed Teston Road project will fragment the forest habitat along the East Don River, resulting in a loss of interior forest habitat, the remaining forest in the vicinity of the project may no longer be suitable for Woodland Raptor Nesting.

Specialized Habitat for Wildlife – Seeps and Springs (Candidate)

Seeps have been recorded in headwater areas within the project limits, although the scale and extent of these features are unknown and so the criteria for this SWH could not be confirmed. As the proposed alignment for the Teston Road extension will run directly through the headwaters of the East Don River, if seeps are present in the vicinity they may be directly and permanently impacted by construction of the roadway.

Specialized Habitat for Wildlife – Woodland Area Sensitive Bird Breeding Habitat (Candidate)

Woodland Area Sensitive Birds require large tracts of forest with interior forest habitat (i.e., forest habitat > 200 m from a forest edge). As the proposed Teston Road project will fragment the forest

habitat along the East Don River, resulting in a loss of interior forest habitat, the remaining forest in the vicinity of the project may no longer be suitable for Woodland Area Sensitive Bird Breeding.

Habitats for Species of Conservation Concern – Open Country Bird Breeding Habitat (Confirmed)

Open Country Breeding Birds require large, undisturbed tracts of grasslands or meadows. As the proposed Teston Road project will fragment the meadow habitat east of the East Don River, resulting in a loss of interior meadow habitat, the remaining meadows in the vicinity of the project may no longer be suitable for Open Country Bird Breeding.

Habitats for Species of Conservation Concern – Amphibian Movement Corridors (Candidate)

Given that amphibians are known to travel long distances over land to move between breeding wetlands and hibernation sites seasonally, construction of a roadway through a continuous tract of wetlands and adjacent upland habitats will result in creation of a barrier to Amphibian Movement Corridors, and introduce the threat of road mortality to amphibian populations.

6. MITIGATION AND AVOIDANCE MEASURES

The following mitigation measures are proposed based on current legislation, regulations, and specifications, as well as on impacts anticipated from the available design. It is noted however that the project timeline is subject to change and may result in a delay between the presentation of this impact assessment, the detailed design, and the commencement of construction. During that time there is potential for changes to legislation, regulations, specifications, wildlife habitat, and wildlife presence. Therefore, mitigation measures recommended here must be reviewed, in the context of the design, and updated as necessary prior to construction.

6.1 Aquatic Habitat

In order to protect fish and fish habitat and ensure that the construction works will not result in serious harm to fish or fish habitat, the mitigation measures (measures to avoid causing harm to fish and fish habitat) as summarized below should be followed.

- Work at Site 1 will be carried out within the in-water timing window between **June 15 – September 15** when water levels are depressed and to avoid harming fish during critical life stages. Future work at Site 2 will be carried out within the in-water timing window of **July 1st to September 15th**, to protect Redside Dace and their habitat downstream of Teston Road.
  - Bridge and future culvert works will be carried out in the dry, within the confines of cofferdams.
  - Work area dewatering will be directed to a flat vegetated area at least 30 m from the receiving watercourse or ditchline or outlet into a filter bag (also 30 m from surface water features) to allow sediments to settle out before re-entering the watercourse.
- Minimize vegetation removal on the waterbody banks where possible in order to maintain shading and bank stability.
  - Stabilize disturbed banks with native seed mixture and/or cover exposed areas with erosion control measures until seeding or planting can occur.
  - Clearing shall be completed in accordance with the specifications outlined in **Ontario Provincial Standard Specification (OPSS) MUNI-201: Construction Specification for Clearing, Close Cut Clearing, Grubbing, and Removal of Surface and Piled Boulders**.
- Reinstate and stabilize banks disturbed during construction to pre-construction or better condition.
  - Exposed areas will be revegetated using a seed mix composed of native species that are appropriate for the site conditions, as per **OPSS.MUNI-804: Construction Specification for Seed and Cover**
- Grading operations must be completed as per **OPSS.MUNI-206: Grading**
  - Topsoil will be replaced after grading operations as per **OPSS.MUNI-802: Construction Specification for Topsoil**.

- Use of effective erosion and sediment control measures including topsoil and seed, sediment fence barriers, and erosion control blankets as per **OPSS.MUNI-804: Construction Specification for Seed and Cover** and **OPSS.MUNI 805 Temporary Erosion and Sediment Control Measures**.
- Operation of equipment in waterbodies or on waterbody banks shall be carried out according to **OPSS.MUNI-182: Environmental Protection for Construction in Waterbodies and On Waterbody Banks**
  - Have spill kits onsite and drip pans under all non-mobile machinery.
  - Refueling, maintenance and necessary repairs shall be carried out on a site designated for this purpose located 30 m way from any waterbody
  - Heavy machinery access and staging will be limited to areas within the new ROW and along the banks of the watercourse.

6.2 Terrestrial Habitat

Vegetation and Soils

As shown in **Table 10**, vegetation clearing is required as part of the proposed Teston Road project. Therefore, mitigation and restoration measures are required. It is recommended that the following measures be implemented for vegetation removals, in addition to any recommendations within MH's arborist assessment and tree preservation plan:

- All vegetation removals will be completed as per **OPSS.MUNI-201: Construction Specification for Clearing, Close Cut Clearing, Grubbing, and Removal of Surface and Piled Boulders.**
- In areas requiring only temporary disturbance and where feasible, grubbing will not be completed in order to promote more rapid regrowth of vegetation.
- Surplus material resulting from vegetation and earth removal operations should be handled as per **OPSS 180: General Specification for the Management of Excess Materials**.
- Any damaged trees not being removed shall be pruned or treated as outlined in **OPSS 801: Construction Specification for the Protection of Trees**.
- Trees and treed areas to be protected will be protected as per the *York Region Street Tree and Forest Preservation Guidelines*. It is noted that an Arborist Report and Tree Preservation Plan are being prepared by MH and will address impacts to individual trees in more detail.
- Minimize vegetation disturbance wherever possible by reducing temporary working easements, limiting equipment storage areas and vehicle turning points to open areas dominated by exotic species, and reducing ROW footprints as per TRCA's *Forest Edge Management Plan Guidelines* (2004). Limits of construction shall be clearly delineated to avoid intrusion into adjacent areas.
- Areas of vegetation disturbed and requiring cover shall be planted with native species appropriate for the area and site conditions, in accordance with the *Vegetation Restoration*

Plan (**Section 7.2**), and as per **OPSS 803: Construction Specification for Vegetative Cover** and **OPSS 802: Construction Specification for Topsoil**.

- To maintain soil conditions appropriate for restoring vegetation, soil should be managed as per TRCA's *Preserving and Restoring Healthy Soil: Best Practices for Urban Construction* (2012).
- The Contractor must ensure that machinery arrives on site in a clean condition and is maintained free of excess or leaking fuel, lubricants, coolant or any other contaminants for the duration of construction, as per **OPSS.PROV 182: General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks**.
- The limits of Designated Natural Areas (PSW and ANSIs) will be shown on the contract drawings as Environmentally Sensitive Areas, and equipment, construction, etc. will not extend beyond the work limits, into these areas.
- Stockpiling of materials shall be limited to clearly identified locations within the project footprint as per **OPSS.MUNI-180: General Specification for the Management of Excess Materials**.
- All disturbed soils will be properly contained to prevent silt and sediment from entering watercourses, ditches, and adjoining properties and lands as per using **OPSS-804: Construction Specification for Temporary Erosion Control** and **OPSS-805: Construction Specification for Temporary Sediment Control**. Erosion and sediment controls shall be frequently monitored maintained, adapted, and repaired as required to remain effective at all times.
- Vegetation should be maintained for as long as possible prior to disturbance. Excavations and removals shall be performed in such a manner and with such equipment as to leave undisturbed and undamaged any portion of an area not designated for removal/excavation or salvage. All damaged or disturbed areas shall be corrected expeditiously, in accordance with **OPSS MUNI 510: Removals**.
- A Spill Response Plan must be prepared that outlines the measures that will be implemented, such as spill kits, and drip pans under all non-mobile machinery, and must be kept on site at all times. Details pertaining to spill prevention and response for operation of machinery and storage of deleterious substances (i.e., fuel, oil etc.) shall be included in this plan to ensure adequate mitigation measures are implemented to prevent release of such substances into the adjacent waterbody or soils. All spills shall be reported to the Ministry of Environment (MOE) Spills Action Centre (1-800-268-6060) as well as to DFO and MNRF Aurora District if there is potential for significant impacts to fish or fish habitat and/or wildlife resources.
- Areas within the work limits contain two (2) invasive plant species (Common Reed and Japanese Knotweed) which are restricted species under Invasive Species Act Regulations (O. Reg. 354/16). Regulations for restricted invasive species include ensuring these species are not spread/deposited elsewhere into new locations. Therefore, the spread of invasive and noxious vegetation species to, from and within the work limits must be prevented.

- Implementation of best management practices to prevent the introduction/spread of invasive plants will be required, including proper soil management and equipment clearing protocols. Guidelines outlined in the *Invasive Phragmites – Best Management Practices in Ontario*, (OIPC, 2011) and *Invasive Japanese Knotweed – Best Management Practices in Ontario*, (OIPC, 2012), shall be followed.
- Debris including earth clods or invasive and noxious vegetation material attached to the outside surfaces of equipment is prohibited from entering the work limits. Equipment coming on site shall be inspected as close to the site entrance as possible for debris, and if present, debris shall be completely removed and collected for disposal, prior to the equipment proceeding to the work area
- Surveys within the disturbance limits to delineate invasive species are required closer to commencement of the project. Where invasive species have been identified within the limits of disturbance associated with the work, these areas will be clearly marked on the contract drawings. The Contractor shall clean all vehicles and equipment exposed to invasive plants prior to leaving the site.
- Best Management Practices set forth in the Clean Equipment Protocol for Industry (Halloran et. Al, 2013), prepared by the Peterborough Stewardship Council and the Ontario Invasive Plant Council for the Canada-Ontario Invasive Species Centre and the MNRF, shall be followed at all times.
- Soils from areas impacted by invasive vegetation shall not be stockpiled for reuse.
- No invasive species shall be present in fill or topsoil brought on to the site to complete the work.
- A disposal plan will be required to dispose of invasive species and soils containing invasive species. Soils containing invasive species are difficult to accommodate at some landfill facilities, as these soils are not clearly defined, and most landfills deem it a contaminated soil. Though considered a non-hazardous material, many landfill locations do not accept invasive species containing soils.

Operation of Machinery

The following mitigation measures are recommended to minimize potential for disruption to wildlife, during construction:

- All equipment shall be maintained in an operating condition that prevents unnecessary noise, including but not limited to non-defective muffler systems, properly secured components, unnecessary idling/running, and the lubrication of moving parts.
- All work will conform with York Region Noise bylaws unless an exemption is obtained.
- Night work should not occur in proximity to potential bat maternity roost trees. If night work must occur, lighting must be directed away from bat habitat areas and toward the work zone, to the greatest degree possible.
- As per **OPSS MUNI 506: Dust Suppression**, steps shall be taken as necessary to control dust resulting from operations such that it does not enter surface waters or escape beyond the working area to cause a nuisance to wildlife. Dust suppressants shall be applied in a manner that avoids ponding, runoff, drifting, and tracking of the material beyond the area

of application. Dust suppressant application shall not proceed during periods of rain when the surface is in a saturated condition or on areas of ponded water. Dust suppressants, other than water, shall not be applied when weather forecasts indicate a high probability of rainfall in order to minimize loss of the material from the intended area of application. Areas receiving rainfall within 6 hours after application may require reapplication of the material.

Designated Natural Areas

The proposed work will occur within several designated natural areas as shown in **Table 9**. Wherever possible, it is recommended that negative impact areas be restored to conditions similar to pre-construction conditions. Compensation plantings to offset permanent impacts to designated areas should be focused on areas connected to remaining intact habitats, or on creating additional connections to adjacent habitats, to maximize ecological function in the area; refer to **Section 7** for further discussion of future commitments, including restoration and potential ecosystem compensation. MH's Arborist Assessment and Tree Preservation Plan (prepared separately) provides further detail on tree removals, tree protection, and re-planting plans. Mitigation and avoidance measures required for vegetation and soils (above) will also reduce temporary impacts within designated natural areas, during construction.

Significant Wildlife Habitat

Several confirmed and candidate SWH types have been identified and will be impacted by the project. Emphasis on restoration of suitable vegetative species in particular locations will help to ensure continuation of SWH in the area. Further surveys to confirm several SWH types are recommended, in order to better determine suitable restoration or compensation measures to reinstate lost habitat. Alternatively, SWH can be presumed to be present, and restoration/compensation can be planned accordingly (refer to **Section 7** for further discussion on future commitments pertaining to SWH). Mitigation and avoidance measures required for Wildlife and Migratory Birds (below) will also reduce temporary impacts within SWH, during construction.

Wildlife and Migratory Birds

The Migratory Birds Convention Act (MBCA) provides legal protection to migratory birds in Canada, and prevents harm, harassment, or destruction of their young, nests, and eggs. Modernized Migratory Birds Regulations under the MBCA came into force on July 30, 2022. The new regulations, provide protection to most migratory bird nests only when they are considered to have a higher conservation value for migratory birds (i.e., when they are active or in use). However, 18 migratory bird species are listed under Schedule 1 of the Migratory Birds Regulations, and nests of these species receive protection year-round unless they have been shown to be abandoned for a specified period of time. Two (2) Schedule 1 species, Pileated Woodpecker and Great Blue Heron, have been observed within or adjacent to the project limits, and one (1), Green Heron, has potential to be present as well. Therefore, further studies to determine nest locations for these species are recommended and are discussed in **Section 7**.

Under the Fish and Wildlife Conservation Act (FWCA) 1997, a person shall not destroy, take, or possess fish or the nest or eggs of a bird that belongs to a species that is wild by nature; this Act generally applies only to birds not covered under the MBCA. The FWCA also regulates the conditions under which numerous species of fish, mammals, reptiles, amphibians, and birds can be caught or hunted, which is defined under the Act to include pursuing, chasing, capturing, harassing, injuring, or killing. The following avoidance and mitigation measures are recommended to avoid impacts to MBCA and/or FWCA protected birds as a result of the Project activities:

- Individuals, nests, eggs, or young of MBCA or FWCA protected birds shall not be disturbed or destroyed at any time.
- All vegetation and tree removal and/or clearing operations must be completed after August 31 and before April 1 of any year, outside of the breeding bird active nesting season.
    - In the event a tree removal must occur between April 1 and August 31, the Contractor must retain a Qualified Avian Specialist to conduct a survey to confirm that no nests are present, prior to clearing. Nest search surveys are only suitable on isolated trees or in sparsely vegetated areas; they are not to be relied on as an alternative to abiding by the timing window for breeding birds.
- If a bird showing behaviour indicative of nesting (e.g., carrying nesting material, alarm calling, acting agitated, etc.) and/or nests or young birds are encountered in the work limits at any time, consultation with an Avian Specialist shall be completed, and works will not continue in the location of the observation until after August 31 (or until the area is determined by the Avian Specialist to no longer be in use by breeding birds). Species specific buffers (or setback distances) in which no work can occur may be established by the Avian Specialist surrounding nests or other observations, using guidance provided by ECCC.

To prevent impacts to other wildlife during construction, the following shall be implemented:

- A daily pre-construction search of all machinery and the work area shall be implemented to identify presence of wildlife, as animals may be found hiding or basking around equipment, rocks, debris piles etc., especially if they are displaced during construction.
- Before filling any holes or trenches, they shall be inspected for wildlife, and any trapped wildlife shall be removed and released nearby.
- Any wildlife encountered in the work area will not be knowingly harmed and shall be allowed to move away from the work area on their own. In the event that any wildlife encountered does not move away from the area or is injured, the Contract Administrator shall be notified immediately, and a Qualified Biologist should be contacted for recommendations to prevent harassment and/or harm to applicable wildlife.
- A worker awareness program shall be provided to all on-site personnel for all wildlife likely to be encountered on site, which includes species identification, habitat characteristics, and species-specific guidance with respect to appropriate actions to be taken if these species are encountered.
- The Contractor should be advised that any brush piles or soil stockpiles should be tarped or covered to ensure they do not provide nesting, denning, or hiding opportunities for

wildlife, unless the intent of such brush piles or soil stockpiles is to provide intentional temporary cover for wildlife during construction.

- Wherever work in or adjacent to water (e.g., in-filling, work adjacent to wetlands or around bridge abutments, etc.) will occur, heavy duty silt fencing and turbidity curtains shall be installed within and adjacent to all turtle habitat areas, to prevent or minimize the risk of harm to turtles by physically preventing turtles from entering the work areas at any time prior to or during construction. Where work in water must occur during the peak activity period for turtles (i.e., April 1 to October 31), heavy duty silt fence and turbidity curtains shall be installed around the work limits, prior to the peak activity period (before April 1), and shall be frequently monitored and maintained for the duration of construction.
- There is potential for turtle nesting in gardens, in lawns areas, along trail systems and roadways, and on sun exposed slopes, or they can be created during construction if there are exposed soils from excavation or soil stockpiles present during the nesting season. If a nesting turtle is observed at any time (i.e., digging or sitting on a nest), the MNRF shall be notified immediately, a five (5) metre buffer zone shall be flagged around the nest site, and the area shall be protected from harm during the nesting season, unless otherwise managed (i.e., relocation or offsite incubation) with MNRF's approval.
- If a turtle is sighted during construction, work will immediately stop near the turtle, and it should be allowed to move out of the work area on its own. The Contractor should immediately notify the Contract Administrator, and the Contract Administrator will be responsible for notifying the MNRF for further direction.

As a result of identified potential roosting habitat (i.e., maternity roost trees) for SAR and non-SAR bats, the following mitigation and avoidance measures to avoid impacts to these species, which are protected under the FWCA and/or ESA, shall be implemented:

- **No tree removals or vegetation clearing can occur in potential bat habitat areas** (i.e., where potential maternity roost trees were identified) **until it is first confirmed through acoustic monitoring whether SAR bats are present**, and whether a permit (or other authorization) under the ESA is required for impacts to SAR bats and their habitat (refer to **Section 7**).
- Removals of trees that are potential bat maternity roost trees will not be permitted during the active bat season, from April 1 to September 30 of any year. All potential roost trees shall be clearly marked on the contract drawings.
- Night work should not occur in proximity bat habitat areas. If night work must occur, lighting must be directed away from bat habitat and toward the work zone, to the greatest degree possible.

Species at Risk

Numerous SAR have been identified as present or potentially present within the project limits, as described herein. Those that have been confirmed as present have a higher likelihood of being encountered during the project. If a SAR is encountered within the work limits at any time that is likely to be impacted by the operations:

- The Contractor shall immediately notify the Contract Administrator and suspend operations within the area identified by the Contract Administrator, as per **OPSS MUNI 100: General Conditions of Contract**.
- Work shall remain suspended within that area until otherwise directed by the Contract Administrator in writing, that the work can proceed; the Contract Administrator must contact a Qualified Biologist for species specific recommendations.

In addition, the following actions are anticipated for confirmed SAR that are listed as Threatened or Endangered, that have been assessed as being impacted by the project.

Bank Swallow

Although Bank Swallow nesting habitat is not currently present, there is the potential for this species to arrive on site following commencement of construction activities as they are attracted to nesting in loose soils such as those resulting from construction of embankments and slopes, or those found in stockpiles of soils. If work within stockpiles or slopes is required during the breeding bird season, a slope reduction plan should be used to deter nesting by Bank Swallows, and can be achieved by:

- Sloping off stockpiles (using a bulldozer excavator etc.).
- Contouring slope faces.
- Piling materials on the face (exclusion).

Note that any slopes or parts of slopes that are not rendered unsuitable can be occupied as quickly as overnight. For work sites that are operational daily, slopes should be left at 70 degrees or less at the end of each day. Slope reduction measures should continue throughout the breeding bird season (April 1 – August 31) of any year.

Bobolink and Eastern Meadowlark

Bobolink and Eastern Meadowlark are both listed as Threatened species and receive habitat and species protection under the ESA, O. Reg. 830/21. Clearing of this habitat must be avoided between April 1 and August 31 to avoid direct impacts to these species. Based on current regulations, an authorization under the ESA will be required to address the loss of habitat for these species and their habitat, as described in **Section 7**.

Butternut

Given the locations of known Butternuts currently, no specific actions are anticipated, as these trees are greater than 50 m from the proposed project limits. However, there is potential for new trees to establish at different locations before commencement of the project. If this species is identified within the project limits at a later time, appropriate actions will need to be undertaken and authorization under the ESA will need to be obtained for this species (refer to **Section 7**).

Black Ash

Given the locations of known Black Ash trees, no specific actions are anticipated, as these trees are located well beyond the proposed project limits. However, there is potential for new trees to

establish at different locations before commencement of the project. If this species is identified within the project limits at a later time, appropriate actions will need to be undertaken and authorization under the ESA will need to be obtained for this species (refer to **Section 7**).

Species at Risk Bats

Surveys for potential bat maternity roost trees have indicated that potential SAR bat habitat is present. Therefore, acoustic surveys as per Phase III: Acoustic Surveys of The Protocol need to be completed targeting potential roost locations, to determine whether SAR are present and if actions for SAR bats and authorization under the ESA are required before the project can proceed (refer to **Section 7**).

Blanding's Turtle

No Blanding's Turtles have been observed to date, though suitable habitat is available within the project limits. Therefore, it is recommended that targeted surveys be carried out to determine the presence or absence of this species. In the event that presence is confirmed, an overall benefit permit or other authorization under the ESA may be required (refer to **Section 7**).

7. SUMMARY AND FUTURE COMMITMENTS

A review of potential constraints related to terrestrial features, and fish and fish habitat was completed for the proposed Teston Road project. Background research and field studies coupled with agency consultation were used in the determination of habitat function and significance, which has resulted in identification of the following noteworthy features:

- Designated Natural Areas
- SWH
- SAR and SAR Habitat
- Rare Vegetation and Wildlife
- Significant Fish Habitat
- Environmentally sensitive areas (e.g., ground water upwellings, wetlands)

Through correspondence with the MNRF Aurora District, supplemented with background data review and field investigations determined that the project area contains the headwaters for the East Don River and most tributaries support fish and fish habitat. Redside Dace have been recorded by Fisheries and Oceans Canada, the Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre, and Land Information Ontario as occurring within multiple tributaries within the Don River East Branch. Preliminary field investigations have determined that suitable habitat for Redside Dace is present within the Don River East Branch.

Numerous terrestrial constraints have been identified within the project limits and will require appropriate mitigation and avoidance measures during construction to minimize the scale and permanency of impacts to the greatest degree possible (refer to **Section 6.2**). Despite implementation of mitigation and avoidance measures, the project will have permanent impacts on terrestrial wildlife and their habitat, therefore restoration and habitat compensation will be required to minimize and mitigate these impacts (refer to Section **7.2**).

In consideration of the site conditions, including opportunities and constraints, the following outlines recommended future field investigations and recommendations site restoration and habitat compensation.

7.1 Recommended Future Field Surveys

Aquatic Field Surveys

During the detailed design stage it is recommended that aquatic field investigations take place to update or confirm fish habitat and aquatic conditions to ensure they are consistent with those collected in 2020 and 2022. Field investigations should include confirmation of the following at Site 1, Site 2, and Site 3:

- Watercourse type characterization
- Determination or confirmation of fish species present
- Confirmation of in water timing windows
- Identification of specialized habitat features

- Identification of physical barriers to fish movement
- Confirmation of aquatic habitat sensitivity
- Water quality monitoring

Terrestrial Field Surveys

Based on the existing conditions documented on site to date and the impact assessment presented in this report, recommendations for additional terrestrial field surveys are outlined below. It is noted, however, that the next steps of the project as they relate to natural environment assessment will need to be conducted in accordance with up-to-date guidelines and legislation at the time of the detailed design. Legislation and listed species are periodically updated and will need to be consulted during the detailed design stage to identify any changes. The following recommendations are written based on current requirements.

- As numerous potential maternity roost trees for SAR bats have been identified, acoustic surveys per Phase III: Acoustic Surveys of The Protocol are recommended, as soon as possible before Phase II: Identification of Suitable Maternity Roost Trees surveys need to completed again. Acoustic surveys will confirm whether SAR bats are present in potential maternity roost trees in the area and will assist in determining whether authorization under the ESA will be required.
- As tree conditions and characteristics are subject to change (e.g., further decay, new loss of limbs or woodpecker activity creating cavities, wind blowdown, etc.), if Phase III: Acoustic Surveys of the protocol are not initiated in the next few years (~2 years), Phase II: Identification of Suitable Maternity Roost Trees of The Protocol should be completed again prior to completing Phase III, to ensure current maternity roost tree conditions are captured.
- Wetland boundaries within the project limits, particularly surrounding PSWs and wetland communities of regional conservation concern (L1-L3), should be confirmed closer to the undertaking.
- It is anticipated that an authorization from TRCA under O. Reg. 41/24: Prohibited Activities, Exemptions and Permits will be required. Mitigation measures with regard to the regulated area should be discussed with TRCA at the time of the application.
- As several potential Significant Wildlife Habitat types are present (e.g., Reptile Hibernaculum, Bat Maternity Roosting Colonies, etc.) further surveys to assess these SWH within and adjacent to the project limits are recommended. Alternatively, these SWHs can be presumed present, and planned for accordingly within the design and restoration plans.
- Due to regulation changes that came into force under the Migratory Bird Conventions Act (MBCA) in Year 3 (2022) which have resulted in the requirement to identify nests (either active or abandoned) belonging to Schedule 1 species that may have potential nesting habitat within or adjacent to the project limits, it is recommended that surveys to confirm locations of these species' nests, if present, are completed. Schedule 1 species requiring nest searches within the Technically Preferred Alternative limits include: Pileated Woodpecker, Great Blue Heron, and Green Heron.

- Surveys must be completed to confirm presence/absence of nests belonging to Schedule 1 species within or adjacent to the project limits, closer to commencement of the project but with enough time to complete any multi-season or multi-year surveys if required (as outlined below for abandoned nests).
- Schedule 1 nests will be protected year-round unless they have been shown to be abandoned. In order to be considered abandoned:
  - The Minister must be notified, via an online registration, through the Abandoned Nest Registry, that the nest does not contain a live bird or viable egg; and
  - The nest must remain unused by migratory birds during the designated wait time for that species: for Pileated Woodpecker – 36 months, for Great Blue Heron – 24 months, and for Green Heron – 24 months.
- Targeted surveys to determine the presence or absence of SAR Blanding's Turtles within and adjacent to the project limits are required to determine whether actions/authorization under the ESA are required for this species.
- While there are currently no Butternuts or Black Ashes within the proposed work limits, since these species are already present in the vicinity, they can readily establish in new locations in the area over a short time period. Therefore, given the anticipated time lag before commencement of the project, there is opportunity for Butternut and Black Ash trees to establish in new locations in the area, and presence/absence of this species may need to be reassessed. Surveys for SAR trees (Butternut and Black Ash) are recommended within and adjacent to the project limits again, closer to commencement of the project, to determine whether these species have exploited new locations, and whether actions/authorizations under the ESA are required.
- Field investigations to confirm locations and limits of invasive species should be completed as part of the detailed design, to inform appropriate removal and management measures or best management practices for their removal and disposal.
- As there will be impacts to Eastern Meadowlark and Bobolink, both of which are Threatened species receiving habitat protection under the ESA, actions under the ESA are required. For impacts to areas of habitat equal to or less than 30 ha, the proponent must satisfy one of the two following options as prescribed in O. Reg. 830/21 Section 13 and summarized below:

Option 1 – Pay a Species Conservation Charge

- Pay a conservation charge to the Species at Risk Conservation Trust in accordance with paragraph 5 of subsection 20.3 (1) of the Act and O. Reg. 829/21 (Species Conservation Charges).
  - Before commencing the activity, submit a notice of activity (NOA) to the Minister through the Registry including:
    - Description of activity.

        - The area of habitat in hectares.
        - Proposed start and end dates of the activity.
        - Why the activity will occur in grassland habitat.
    - Before, during, and after carrying out the activity, minimize adverse effects on Bobolinks, Eastern Meadowlarks and their habitat, including:
        - No activity carried out between May 1 and July 31 that is likely to damage or destroy habitat or kill, harm, and harass Bobolink or Eastern Meadowlark.
        - Take reasonable steps to minimize adverse effects of the activity.
        - Prepare and update a Bobolink and Eastern Meadowlark management plan.
        - Retain a copy of the management plan for at least five (5) years and provide a copy to the Ministry within 14 days of receiving a request.

Option 2 – Create or Enhance Grassland Habitat

- Before commencing the activity, submit a notice of activity (NOA) to the Minister through the Registry including:
    - Description of activity.
    - The area of habitat in hectares.
    - Proposed start and end dates of the activity.
    - Why the activity will occur in grassland habitat.
- Before, during, and after carrying out the activity, minimize adverse effect on Bobolinks, Eastern Meadowlark, and their habitat, including:
    - No activity carried out between May 1 and July 31 that is likely to damage or destroy habitat or kill, harm, and harass Bobolink or Eastern Meadowlark.
    - Take reasonable steps to minimize adverse effects of the activity.
- Prepare and update a Bobolink and Eastern Meadowlark management plan as per the regulation.
    - Retain a copy of the management plan for at least five (5) years and provide a copy to the Ministry within 14 days of receiving a request.
- Within 12 months of commencing the activity, create new habitat or enhance existing habitat for Bobolinks and Eastern Meadowlarks as per the regulation.
    - Manage the created habitat for five (5) years after the habitat is created or enhanced.
- Before commencing the activity, give the Minister a written undertaking to continue, after the end of the five-year management period (above), to manage any habitat created or enhanced until the earlier of:
    - The end of the 20-year period that follows the creation or enhancement of the habitat; or
    - If the habitat that was destroyed by the activity is returned to a suitable state to be used by Bobolinks or Eastern Meadowlarks, the day on which the area reaches that state.
- Prepare a record of created or enhanced habitat as per the regulation.

- For a period of five years after the habitat is created or enhanced, monitor the area in which the habitat was created or enhanced by conducting at least three (3) surveys every year at a time when Bobolinks or Eastern Meadowlarks are likely to be present, to determine if the species are present and, if so, to assess fledgling success.
- Retain the habitat record until December 31 of the final year of the five-year period of managing and monitoring the new or enhanced habitat and provide a copy to the Ministry within 14 days of receiving a request.

7.2 Restoration Recommendations and Commitments

This section of this report is intended to identify restoration or compensation strategies, and opportunities for maximizing habitat at the site for wildlife in post-construction conditions. These recommendations are illustrated in **Figure 7**. Surveys required at the detailed design stage to support restoration and compensation plans are also identified in this section.

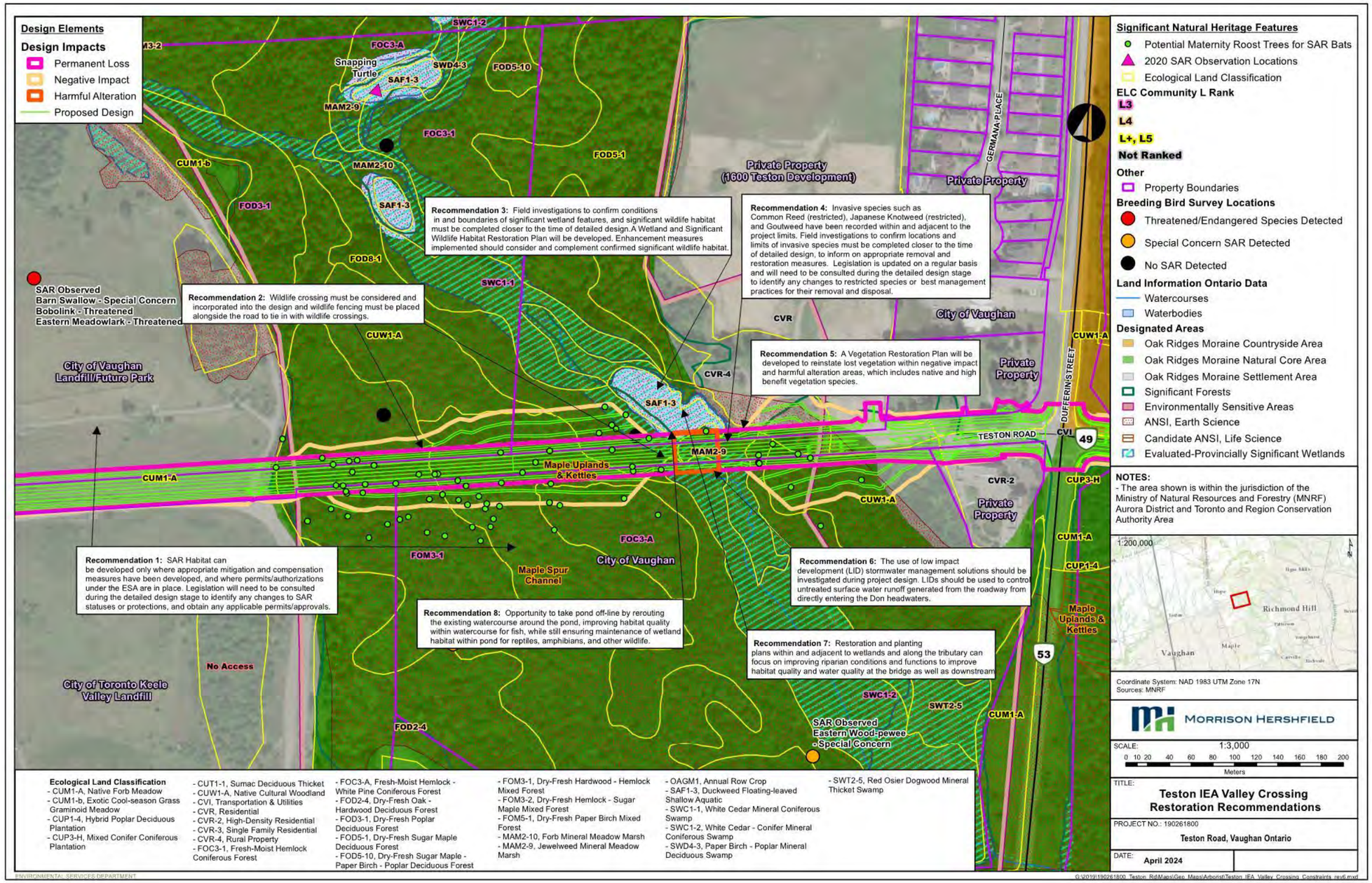

Figure 7: Restoration Recommendations

Recommendation 1 – Species at Risk

Species at Risk habitat compensation will be addressed as part of detailed design based on up-to-date site conditions and legislative requirements. Based on information gathered within the Technically Preferred Alternative limits, confirmed SAR habitat requiring compensation includes habitat for Bobolink and Eastern Meadowlark, and potential SAR habitat requiring compensation includes habitat for SAR bats.

Recommendation 2 – Wildlife Crossing

As wildlife movement corridors will be impaired by the project, including for White-tailed Deer, leading to increased susceptibility to road mortality and motorist collisions with wildlife, wildlife passages should be implemented in suitable locations, should be of sufficient size, and should be designed with features that facilitate wildlife movement across the roadway. A Wildlife Crossing Plan should be developed as part of detailed design. Wildlife crossing for deer, small mammals, turtles, and amphibians will be considered and incorporated into the detailed design. This will include wildlife fencing alongside the road within and adjacent to habitat for these species to tie in with wildlife crossings and encourage use by wildlife. There may be additional opportunities for wildlife crossing associated with a proposed trail connection.

Recommendation 3 – Significant Wetlands and Significant Wildlife Habitat

A Wetland and Significant Wildlife Habitat Restoration Plan should be developed to accurately characterize these areas, identify opportunities to minimize impacts, and to develop appropriate mitigation and restoration measures for any impacts in consultation with the MNRF. Impacts to Significant Wetlands and Significant Wildlife Habitat will be assessed as part of detailed design based on up-to-date site conditions. Field investigations to confirm conditions in and boundaries of significant wetland features, as well as locations and limits of SWH will be completed as part of detailed design. Key considerations at detailed design, based on the results of these surveys, will be ensuring maintenance of wetland connectivity and appropriate restoration or compensation of wetlands. Enhancement measures implemented as part of the restoration plan should consider and complement confirmed SWH within the project limits, and may include turtle nesting areas, turtle basking areas, reptile hibernacula, bat houses, duck nesting structures, and more.

Recommendation 4 – Invasive Species Removal and Management

An Invasive Species Management Plan should be developed to document up-to-date conditions and removal and management plans. Invasive species such as Common Reed (restricted), Japanese Knotweed (restricted), and Goutweed have been recorded within and adjacent to the project limits. Field investigations to confirm locations and limits of invasive species will be completed as part of detailed design to inform appropriate removal and management measures. Legislation is periodically updated and will need to be consulted during the detailed design stage to identify any changes to restricted species or best management practices for their removal and disposal.

Recommendation 5 – Vegetation Restoration

A Vegetation Restoration Plan will be developed to reinstate lost vegetation within negative impact and harmful alteration areas within the project footprint. Development of a Vegetation Restoration Plan will include recommendations within TRCA's Seed Mix Guideline (2022) and be completed in consultation with the TRCA. Key measures will include planting of native species providing similar or superior benefit to wildlife than those being impacted. Where possible, restoration techniques on site should be in accordance with TRCA's Post-Construction Restoration Guidelines (2004).

Recommendation 6 – Storm Water Management

The use of low impact development (LID) stormwater management solutions should be investigated during project design. LIDs should be used to control untreated surface water runoff generated from the roadway from directly entering the Don headwaters. As groundwater recharge and flow is important in a headwater ecosystem, LIDs should be implemented to ensure there is no net loss of groundwater inputs to the watercourse or adjacent wetlands. A Stormwater Management Strategy that involves LID solutions has been developed and can be found in the Draft Teston Road Drainage and Stormwater Management Report, MH 2023.

Recommendation 7 – Riparian Planting

Restoration and planting plans within and adjacent to wetlands and along the tributary should focus on improving riparian conditions and functions to improve habitat quality and water quality at the bridge as well as downstream. The section of the Don River tributary which falls within the project area is a clear, cold, headwater stream and would benefit from additional woody material and leaf litter contributions and riparian shading.

Recommendation 8 – Take Private Pond Off-line

There is an opportunity to take the existing pond [Duckweed Floating-leaved Shallow Aquatic (SAF1-3) community] off-line by rerouting the existing watercourse around the pond, improving habitat quality within the watercourse for fish, while still ensuring maintenance of wetland habitat within the pond for amphibians and other wildlife. This pond is located on private property therefore this recommendation will need to be addressed in conjunction with the adjacent property owner and developer. DFO should be consulted (i.e., through submission of a Request for Review) on any changes made to existing fish habitat, as a Fisheries Act Authorization may be required to complete this work. To maintain wetland functions, it is important to preserve water quality, quantity, and duration of seasonal inundation or water holding of wetlands. Alterations to water regimes could have negative impacts on wetland communities and their resident species (GEM Services Inc., 2019). If this recommendation is implemented, the detailed design plans will need to ensure that water quality, quantity, and seasonal inundation or water holding in the existing pond is maintained, to reduce the risk of permanent alterations to water regimes resulting in long-lasting and far-reaching impacts to wetland communities and associated wildlife.

7.3 Ecosystem Compensation Recommendations

Ecosystem compensation recommendations are quantified for permanent loss areas, in accordance with the TRCA's *Guideline for Determining Ecosystem Compensation* (2023). This approach to ecosystem compensation uses the basal area per ELC community impacted to determine the ratio of replacement required for that particular community, which can be used to calculate areas of compensation required relative to the area of each community impacted. Since it takes much longer to re-establish treed ecosystems as a result of their long development times and the impracticality of planting large, full-grown trees, this approach attempts to address the issue of lag-time in ecosystem establishment by recommending that that the loss of a mature forest (i.e., a community with a higher basal area) requires replacement with a larger forest (i.e., replacement at a higher ratio) than a non-treed community. **Table 10** shows the ecosystem compensation ratios and results that are recommended to replace permanent loss areas resulting from the project, per ELC community, for all vegetated, non-cultural/non-constructed communities.

Table 11: Areas of Ecosystem Compensation Recommended per ELC Community

ELC Classification	ELC Code	Basal Area (m^2/ha)	Replacement Ratio	Area of Permanent Loss (m^2)	Ecosystem Compensation Area Required (m^2)
Vegetation Communities					
Treed Hedgerow	CUH1-A	N/A	2:1	315	630
Native Forb Meadow	CUM1-A	5	1:1	33,808	33,808
Exotic Cool Season Grass	CUM1-B	5	1:1	1,620	1,620
Exotic Forb Old Field Meadow	CUM1-C	5	1:1	4,733	4,733
Hybrid Poplar Deciduous Plantation	CUP1-4	N/A	2:1	5	10
White Pine Coniferous Plantation	CUP3-2	N/A	2:1	72	144
Mixed Conifer Coniferous Plantation	CUP3-H	N/A	2:1	73	146
Native Cultural Woodland	CUW1-A	8	2:1	3,711	7,422
Native Deciduous Cultural Woodland	CUW1-A3	22	5:1	253	1,265
Exotic Cultural Woodland	CUW1-B	22	5:1	0	0
Fresh-Moist Hemlock Coniferous Forest	FOC3-1	32	5:1	544	2,720
Fresh-Moist Hemlock – White Pine Coniferous Forest	FOC3-A	50	5:1	0	0

ELC Classification	ELC Code	Basal Area (m^2/ha)	Replacement Ratio	Area of Permanent Loss (m^2)	Ecosystem Compensation Area Required (m^2)
Fresh-Moist Poplar Deciduous Forest	FOD8-1	32	5:1	2,410	12,050
Dry-Fresh Poplar Deciduous Forest	FOD3-1	32	5:1	5,476	27,380
Dry-Fresh Hardwood – Hemlock Mixed Forest	FOM3-1	38	5:1	5,030	25,150
Fresh-Moist White Pine – Sugar Maple Mixed Forest	FOMA-A	38	5:1	102	510
Jewelweed Mineral Meadow Marsh	MAM2-9	18	4:1	1,065	4,260
Narrow-leaved Cattail Mineral Shallow Marsh	MAS2-1B	18	4:1	149	596
Duckweed Floating-leaved Shallow Aquatic	SAF1-3	12	3:1	23	69
White Cedar – Conifer Mineral Coniferous Swamp	SWC1-2	40	5:1	176	880
			Total Area (m^2)	**59,565**	**123,393**
			Total Area (ha)	**6.00**	**12.34**

* N/A indicates that a basal area was not available for that ELC community from the MH Arborist Assessment, and a 2:1 replacement ratio was presumed given the cultural conditions associated with the site. A shaded basal area indicates that a basal area was not available for that ELC community, and a basal area from the most similar ELC community was assumed (e.g., basal area for MAS2-1B was presumed similar to MAM2-9, FOMA-A was presumed similar to FOM3-1, etc.). For all CUM communities, a basal area of 5 was applied per the *Guideline for Determining Ecosystem Compensation* (TRCA, 2023) which states that a vegetation community with few or no trees will have a basal area of 5 or less and can therefore be replaced at a 1:1 ratio.

As the foremost project impact will be fragmentation of intact forest and wetland habitats, including to the north and south of the project, and within designated natural areas, priority for compensation should be given to replacing ecosystems adjacent to the project limits. However, given that there are numerous constraints directly at the project location making compensation in the immediate area impractical, including conflicts with new and ongoing developments, conflicts with existing developed areas or with current land uses (e.g., golf courses, cemeteries, park spaces, and private land), and the need to maintain identified grassland habitat for SAR birds – Bobolink and Eastern Meadowlark, coupled with the large total area recommended to accommodate all required compensation areas (minimum of ~ 123,393 m² or 12.34 ha total) as shown in **Table 11**, one (1) or more off-site locations, as proximal as possible to the project, will need to be considered for implementation of ecosystem compensation measures at a largescale to account for permanent habitat losses. Thus, the focus on selecting suitable sites for ecosystem compensation should be on creating new, nearby continuous habitat tracts in locations lacking vegetation, ideally within designated natural areas.

Based on a review of aerial imagery and property ownership in the surrounding area, the greatest potential for implementing compensation in locations meeting these criteria in the vicinity of the

project is on TRCA owned lands of varying sizes; refer to **Figure 8**. The site(s) ultimately selected for compensation will depend on numerous factors, such as stakeholder and landowner agreement, future planned land use in the area(s), and the density of vegetation already at the site(s), etc. The compensation location(s) and detailed ecosystem compensation plans to offset permanent losses from the project will be determined at the detailed design stage. The offsite compensation should incorporate some enhancement and/or wetland compensation components included under Restoration Recommendation 3 – Significant Wetlands and Significant Wildlife Habitat (**Section 7.2**) as well if required or desired.

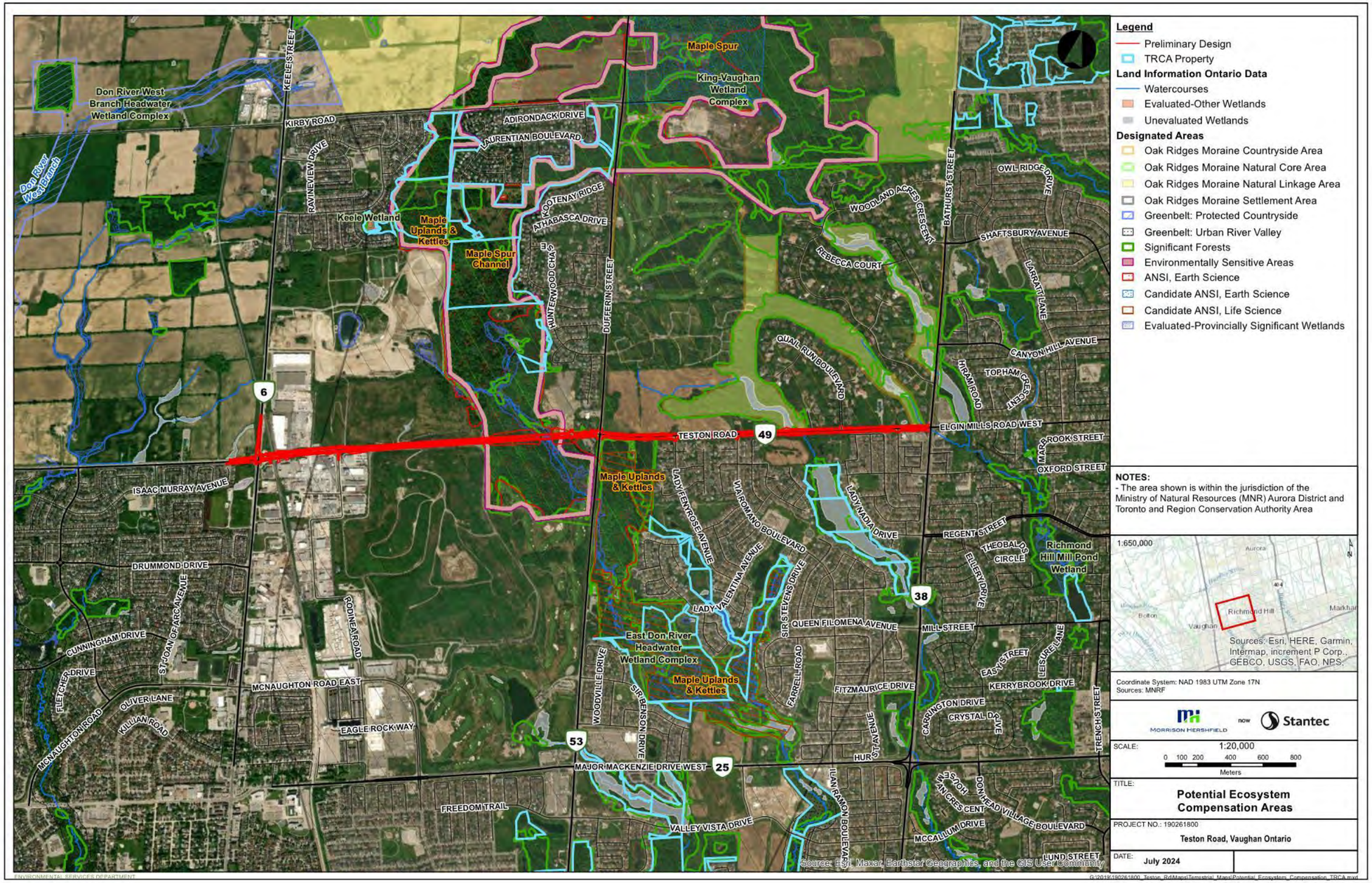

Figure 8: Potential Ecosystem Compensation Areas

8. CLOSURE

York Region retained Morrison Hershfield Limited to conduct the work described in this report, and this report has been prepared solely for this purpose.

This document, the information it contains, the information and basis on which it relies, and factors associated with implementation of suggestions contained in this report are subject to changes that are beyond the control of the author. The information provided by others is believed to be accurate and may not have been verified.

Morrison Hershfield Limited does not accept responsibility for the use of this report for any purpose other than that stated above and does not accept responsibility to any third party for the use, in whole or in part, of the contents of this document. This report should be understood in its entirety, since sections taken out of context could lead to misinterpretation.

We trust the information presented in this report meets Client's requirements. If you have any questions or need addition details, please do not hesitate to contact one of the undersigned.

Morrison Hershfield Limited

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APPENDIX A – Regulatory Correspondence

From: Varga, Steve (NDMNRF) <steve.varga@ontario.ca>
Sent: November 23, 2021 4:51 PM
To: Nick Crockford <NCrockford@morrisonhershfield.com>
Subject: FW: York Region Individual Environmental Assessment for Transportation Improvements - Teston Road Area, City of Vaughan

Hi Nick

As requested at our meeting today I'm enclosing the Life Science Maple Uplands and Kettle Wetlands and Earth Science Maple Spur ANSI report and the wetland evaluation package for the East Don River Headwater Wetland Complex.

All the best
Steve

Steve Varga
Management Biologist | Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry | Aurora District Office
50 Bloomington Road, Aurora, Ontario, L4G 0L8 | Email: steve.varga@ontario.ca | Phone: 289-221-8157
For general inquiries, please contact the Aurora District line at 905-713-7400

From: Nick Crockford <NCrockford@morrisonhershfield.com>
Sent: November 16, 2021 1:32 PM
To: Warren, Catherine (NDMNRF) <Catherine.Warren@ontario.ca>; Varga, Steve (NDMNRF) <steve.varga@ontario.ca>
Cc: 'John, Praveen' <praveen.john@york.ca>; 'Brandon, Philip' <Philip.Brandon@york.ca>; Andrew Harkness <AHarkness@morrisonhershfield.com>; Martin Blouin <MBlouin@morrisonhershfield.com>
Subject: RE: York Region Individual Environmental Assessment for Transportation Improvements - Teston Road Area, City of Vaughan

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

Hi Catherine,

Thank you for getting back to us. I have sent out a teams invite for November 23rd. I booked 90 minutes but we likely won't take the entire time. We'll get you all caught up on the project details and then we can circle back after the meeting with any information/follow up that's needed.

Thanks,

Nick Crockford
Environmental Planner
Morrison Hershfield
416-499-3110

INVENTORY OF THE LIFE SCIENCE MAPLE UPLANDS & KETTLE WETLANDS
AND EARTH SCIENCE OAK RIDGES MORAINE MAPLE SPUR
AREAS OF NATURAL AND SCIENTIFIC INTEREST, CITY OF VAUGHAN, ONTARIO

March 1997, updated September 2000

Steve Varga[1], John Fraser[2] and Lionel Normand[3]
Ontario Ministry of Natural Resources
Aurora District

1. Ontario Ministry of Natural Resources, Aurora District
2. Ontario Ministry of Natural Resources, South Central Region, Science & Technology Section
3. Toronto and Region Conservation Authority

OBM Map: 10 17 6150 48600, 6150 48550, 6200 48600
NTS Map: 30M/13, 30M/14
UTM Reference: 6**210**00 48**610**00
Latitude: 43° 54' **Longitude**: 79° 30'
Area: 282 ha earth science ANSI, 344 ha life science ANSI
Aerial Photographs: 1:10,000, 1978, Roll 30, Line & No. 4363: 113-116; Roll 48, Line & No. 4362: 449-453; Roll 41, Line & No. 4361:70-73; 1:8,000, April 18 1993, Roll 015, Line & No. 26: 137-139; Line & No. 27: 219-223; Line & No. 28: 303-305; 1, 10,000 Infrared, Roll 37, No. 6099-6103, 6277-6281; Roll 46, No. 2196-2198; Roll 47, No. 2639-2642; Roll 48, No. 2831-2836, 2981-2986
Municipality, Lots & Concessions: Regional Municipality of York, City of Vaughan, Vaughan Township: Lots 25-33, Conc. 3; Lots 29-34, Conc. 2.
General Location: northeastern portion of the City of Vaughan bounded by Keele Street to the west, Bathurst Street to east, King- Vaughan Road to the north and Major Mackenzie Drive to the south.
Site District: 6E7
Ownership: largely private
Date of Investigations: 1995: May 18, 31, June 8, 14, 16, July 3, 4, 12, August 2, September 22, 27, 28; 1996: October 4; 1998: September 21.

Introduction

The Maple Uplands & Kettle Wetlands occurs on a southerly extending ridge of the Oak Ridges Moraine, known as the Maple Spur. It is situated north and east of the Town of Maple. This site was identified by the Ontario Ministry of Natural Resources in 1984 as a regional life science Area of Natural and Scientific Interest (ANSI). It was selected for its representation of Sugar Maple - Hemlock upland forest types on the Oak Ridges Moraine (site district 6E7) (Lindsay 1984). Its boundaries were mapped on 1:50,000 NTS maps in 1984 and transferred without modification to 1:10,000 OBM maps in 1992.

The Maple Uplands & Kettle Wetlands is also significant for its earth science features. It contains kettle and meltwater channel features characteristic of moraine physiography. In 1976 it was identified as an "Earth Science Candidate Nature Reserve" (Cowell and Woerns 1976). In 1980 it was selected as a Regionally Significant Earth Science ANSI, known as the Maple Spur of the Oak Ridges Moraine (Cordiner 1982). Its selection was part of the Oak Ridges Moraine - Peterborough Drumlin Field Theme Study for the Landscape Component of the Earth Science Framework under the Ontario Ministry of Natural Resources', ANSI program. The ANSI represents a rolling moraine of sands and gravels rising 30 to 60 meters above the Halton Till plain to the south. It is noteworthy for its large ice block depression and associated meltwater channels. The significant features lie within the boundaries of the associated Life Science ANSI.

The Ministry of Natural Resources in 1990 has identified wetlands in the northern portion of the ANSI as part of the provincially significant King - Vaughan Wetland Complex (OMNR 1990). A 1997 wetland re-evaluation based on 1995-96 fieldwork reconfirmed its provincial significance and expanded the complex to include a cluster of wetlands east of Dufferin Street that are partially in the ANSI (OMNR 1997).

Other agencies have also applied designations to the ANSI. The Toronto and Region Conservation in 1982 has identified the portion of the ANSI east of Dufferin Street as an Environmentally Significant Area (MTRCA 1982). In 1995, the ESA boundaries were expanded west of Dufferin Street to include the ANSI's kettle depression and meltwater channel (MTRCA 1995). York Region in their 1994 Official Plan designated the ANSI an Environmental Policy Area and Wetland, Significant Forested Land and part of a Regional Greenland System (York Region 1994).

In 1995 and 1996 life and earth science inventories were undertaken on the Maple Uplands & Kettle Wetlands and the Oak Ridges Moraine Maple Spur as part of ongoing efforts by the Ministry of Natural Resources to inventory all ANSIs in Ontario. Fieldwork was carried out by the Science and Technology Section of the Ontario Ministry of

Natural Resources, South Central Region office and by staff of the Aurora District office. Staff of the Toronto and Region Conservation Authority also assisted in this inventory work.

This study incorporates previous work undertaken in the area including the fieldwork carried out by the Toronto and Region Conservation Authority (MTRCA 1982), the wetland evaluation carried out by the Ministry of Natural Resources (OMNR 1990, 1997) and botanical collections housed at the Royal Ontario Museum vascular plant herbarium.

Earth Science Features

Physiography

The Oak Ridges Moraine Maple Spur ANSI occurs on a southerly extending ridge of the Oak Ridges Moraine known as the Maple Spur. The moraine is noteworthy for being the largest in southern Ontario, with glacial deposits up to 200 metres deep. The Oak Ridges Moraine is situated north of Metro Toronto stretching west to east for 170 km from the Niagara Escarpment to Northumberland County.

Glacial Geology

At the ANSI, the Moraine consists of a considerable thickness of glaciolacustrine and glaciofluvial sands and finer sediments deposited in close proximity to the margins of northern and southern ice lobes. These ice lobes reached their maximum extent at the present location of the Oak Ridges Moraine during the Port Huron Stadial. During the eventual deglaciation of the area at the end of the Port Huron, parts of the standing ice mass divided into large separate ice blocks surrounded by complex flows of sand and gravel debris which had been eroded and transported by the glacial lobes.

During de-glaciation most of the Maple site was occupied by a large block of glacial ice which was partially buried by glacial sediments melted out of the main ice mass. When the ice block melted it left behind the present depression, with the floor covered in hummocky glacial sediments which formerly covered the ice block. The roughly oval flat-bottomed depression is oriented northeast to southwest and is bounded by steep forest covered slopes 25 to 35 metres high. This major ice-block depression or "kettle" which occupies the central portion of the Maple site is the basis for selection of the area as a regionally significant Earth Science ANSI.

The kettle is also characterized by a number of narrow "spillway" meltwater channels along the eastern and southern margins of the depression. These features are the result of meltwater flow out of the depression into the headwaters of the East Don River during later stages of deglaciation. Three small channels have been mapped along the eastern boundary of the kettle and record meltwater flow out of the depression. Some of these features have been degraded by a borrow pit in this area that has been excluded from the ANSI.

The largest and best developed of the meltwater channel features lies at the southern end of the depression along the eastern boundary of the Keele Valley Landfill. The channel is part of a well-defined valley system, which forms the headwaters of the East Don River. Portions of the western side of the channel margin have been destroyed by land regrading but the channel floor and eastern margins are well preserved and are of significance in the interpretation of the entire site. A representative section of this channel was mapped as part of the field evaluation of the site and has been included in the Earth Science ANSI.

Significance

The site was selected as part of the Oak Ridges Moraine-Peterborough Drumlin Theme Study for the Landform Component of the Earth Science Framework under the Provincial ANSI Program. "The Earth Science Framework is designed to identify the ancient and modern environmental themes that occur in Ontario... The framework is based on internationally recognized concepts of earth science history adapted to Ontario... The geoclimate and landform classifications are most adaptable to the last one million years when glaciation dominated the landscape. The landform classification distinguishes the surficial features of the landscape such as eskers, moraines, raised beaches modern beaches and river valleys. The earth science target is to adequately represent each past environment through features representative of that environment." (Cordiner 1982).

After detailed site inventories are undertaken for a given landform component they are priorized according to criteria which involve the representation provided by the site, its scientific value, its interpretive value for educational purposes, and its condition. Sites are assigned to provincial, regional and local significance levels based on an evaluation of these criteria.

A total of 18 provincially significant sites were identified to achieve protection objectives for a variety of glacial landforms on the Oak Ridges Moraine and Peterborough

Drumlin Field. Several provincially significant sites on the Oak Ridges Moraine contain kettle landforms, notably the Musselman Lake Kettle Complex east of Newmarket. The Maple Uplands and Kettle Wetlands site contains similar landforms and provides additional protection of this landform on the Oak Ridges Moraine at the Regional level of significance. The Maple site is notable however in that the main kettle depression is not water filled as is the case for many of the other kettle landforms on the moraine and thus provides a valuable opportunity for the interpretation of bottom sediments and physiography of these features. The Maple site is also significant because of the large and well-developed meltwater channel associated with it. This feature is important in the interpretation of the depositional and erosional processes involved in kettle formation and ice marginal stagnation.

Other Resource Values

The sand deposits in this area constitute a highly sensitive recharge area which discharges in the southern part of the ANSI and further south providing a major headwater source for the East Branch of the Don River (Gartner Lee Ltd. 1993). North of the ice-block depression the rolling moraine is dotted with small kettle depressions underlain by peat and muck deposits and sustaining a variety of wetlands.

Life Science Features

Vegetation

The Maple Uplands & Kettle Wetlands ANSI supports a high diversity of 66 vegetation community types (Table 1). Most of the ANSI is covered in moist and drier (fresh) upland forests. The moist forests are dominated by Sugar Maple, with Red Maple and Beech often a strong secondary species or co-dominant. Beech is most prevalent in the northeast portion of the ANSI. Other common secondary species include White Ash, Red Oak and White Birch. The richest stands occur on the finer loamy soils. They have an understorey dominated by White Trillium, Yellow-trout Lily and Blue Cohosh, with scattered Wild Ginger, Virginia Waterleaf, Enchanter's Nightshade, Early Meadow-rue, Yellow Violet, Jack-in-the-Pulpit, Rose-twisted Stalk, Peduncled Sedge and Christmas Fern. Stands on coarser soils have an understorey of White Trillium and Wild Sarsaparilla.

In the northeast portion of the ANSI and along the meltwater channel, there are large stands of moist mixed forests dominated by Eastern Hemlock and Sugar Maple, with Beech and Red Maple secondary tree species. The shade caste by the hemlocks results in a sparser herb understorey than those found in the broadleaf forests. Ferns such as Glandular Wood Fern, Spinulose Wood Fern and Marginal Shield Fern dominate the forest floor.

Large stands of moist conifer forests occur in the southwest portion of the ANSI on the floor of the meltwater channel fringing a conifer swamp. White Cedar or Eastern Hemlock with an understorey of Sensitive Fern, Lady Fern and Bulblet Fern dominates these forests.

Drier deciduous forests are scattered throughout the ANSI, with the largest stands in the eastern portion of the ANSI. These forests are dominated by Red Oak with Red Maple and Sugar Maple strong secondary or co-dominant species. The understorey often has a common tall shrub layer of Witch-hazel with scattered shrubs of Beaked Hazel, Maple-leaved Viburnum and Chokeberry. The herb layer is dominated by Wild Sarsaparilla, Pennsylvania Sedge, Large-leaved Aster, Blue-stem Goldenrod and White Trillium. Mixed stands in the central portion of the ANSI (Lots 29 and 30, Conc. 3) have Red Oak, Red Maple and Sugar Maple associated with White Pine.

Successional deciduous forests are common throughout the ANSI as younger stands in among the older forest types. White Birch, Large-toothed Aspen and Trembling Aspen largely dominate these forests. Occasionally the Trembling Aspen co-dominates with Black Cherry or Red Maple. Frequent associates with these successional species are Sugar Maple, White Ash, Red Maple and Black Cherry on moist sites and Red Oak on drier sites.

Occasional successional mixed forests of White Pine co-dominating with White Ash or Trembling Aspen occur on the slopes of the meltwater channel. There is also a stand of Eastern Hemlock co-dominating with White Birch and Trembling Aspen.

Small kettle wetlands are scattered through the northern portion of the ANSI, comprising just over 3 hectares. These wetlands are flooded in the spring and experience a drawdown in the summer, with some of the shallower kettles drying out by the summer. Most common in these wetlands are thicket swamps dominated by Bebb's Willow, Red-osier Dogwood, Winterberry and Heart-leaved Willow. Secondary shrubs in these thicket swamps include Meadowsweet, Pussy Willow, Shining Willow and Slender Willow. Below the shrub layer there is a rich herb layer variously dominated by Water-parsnip, Common Cattail, Eastern Manna Grass, Reed Canary Grass, Short-awned Foxtail, Water Arum and Tufted Loosestrife. Openings in

these thicket swamps support marshes dominated by Common Cattail, Water-parsnip, Eastern Manna Grass and Short-awned Foxtail. Some of the thicket swamps are ringed by open water moats. The best example of such a wetland abuts the eastern side of Dufferin Street in the northern portion of the ANSI (Lot 33, Conc. 2). This thicket swamp of Bebb's Willow and Common Cattail has a broad open water moat. The shrubs grow on Sphagnum moss hummocks and there are a few species typical of bogs including Leatherleaf. Other thicket swamps support such bog species as Chokeberry and Tamarack.

Scattered in the kettle wetlands and on the edges of some kettles are deciduous swamps dominated by Hybrid Maple, Reddish Willow and Peach-leaved Willow.

One small kettle (Lot 33, Conc. 2) supports a floating peat marsh dominated by Three-way Sedge and such strong secondary species as Sensitive Fern, Tufted Loosestrife, Spotted Jewelweed and Sphagnum moss.

Several kettles remain filled with water throughout the year its open waters being covered by Common Duckweed and Columbian Water-meal. In contrast, several small kettles dry out in the summer sustaining meadow marshes of Spotted Jewelweed and Rice Cut Grass.

Two wetlands also occur on the floor of the ice-block depression. The largest wetland supports a meadow marsh of Fowl Manna Grass ringed by a rich mixed swamp of Hemlock with scattered Yellow Birch. The western side of the meadow marsh grades into a regenerating field sustaining a meadow marsh of Narrow-leaved Cattail and Variegated Horsetail. On the southern portion, the wetland grades into a Pussy Willow Heart-leaved Willow and Red-osier Dogwood thicket swamp with Sensitive Fern and Fowl Manna Grass common in the understorey. A smaller second wetland in the ice-block depression supports an open pond covered in Common Duckweed.

A large wetland of about 18 hectares occurs on the floor of the meltwater channel. This wetland is situated on a discharge area and is a source for the East Don. Most of the wetland is covered in a mature conifer swamp of White Cedar and Eastern Hemlock with some of the trees appearing to pre-date European settlement. This semi-open swamp also has scattered trees of Yellow Birch and a rich understorey of Sensitive Fern, Bulblet Fern, Field Horsetail, Fowl Manna Grass, Rough Sedge, Rough Goldenrod, Mountain Maple, Spotted Joe-Pye-Weed and Red-stemmed Aster. Small openings in the swamp support meadow marshes of Spotted Joe-Pye-Weed and Red-stemmed Aster and a small pond is ringed by marshes of Variegated Horsetail, Narrow-leaved Cattail and Common Reed.

Regenerating lands are scattered through the ANSI, with the largest situated on the floor of the ice-block depression on the western side of the ANSI. These regenerating lands provide a critical link between existing woodlands and are reverting back into successional woodlands. They support fields of Tall Goldenrod mixed with Smooth Brome, Kentucky Blue Grass and New England Aster, groves of Trembling Aspen and White Birch and thickets of Staghorn Sumac. Sand Dropseed and Canada Blue Grass dominate the driest fields.

Several small conifer plantations with plantings of Red Pine, White Pine and White Spruce are scattered through the ANSI. The older plantations have a number of native saplings and young trees of Sugar Maple and Red Oak.

Table 1. Vegetation community types

Wetland Community Types

1. Open Water
   a. Common Duckweed
   b. Common Duckweed - Columbian Water-meal
2. Marsh
   a. Water-parsnip
   b. Water-parsnip - Retrorse Sedge
   c. Water-parsnip - Short-awned Foxtail
   d. Eastern Manna Grass
   e. Common Cattail
   f. Three-way Sedge
   g. Common Reed
3. Meadow Marsh
   a. Spotted Jewelweed
   b. Fowl Manna Grass
   c. Variegated Horsetail
   d. Rice Cut Grass
   e. Narrow-leaved Cattail
   f. Red-stemmed Aster - Spotted Joe-Pye-Weed
4. Thicket Swamp
   a. Red-osier Dogwood
   b. Red-osier Dogwood - Bebb's Willow - Meadowsweet
   c. Bebb's Willow
   d. Winterberry - Bebb's Willow
   e. Bebb's Willow - Heart-leaved Willow
   f. **Heart-leaved Willow -** Winterberry - Shining Willow
   g. Heart-leaved Willow
5. Deciduous Swamp
   a. **Reddish Willow** - Red Maple - Balsam Poplar
   b. Peach-leaved Willow
   c. Hybrid Maple
6. Mixed Swamp:
   Hemlock - Yellow Birch
7. Conifer Swamp

a. White Cedar - Eastern Hemlock
b. White Cedar

Terrestrial Community Types

9. Moist Deciduous Forest
a. Red Maple
b. **Red Maple** - Sugar Maple
c. Sugar Maple
d. **Sugar Maple** - Red Maple
e. **Sugar Maple** - Red Maple - Red Oak
f. **Sugar Maple** - White Ash
g. **Sugar Maple** - Beech
h. Sugar Maple - Beech
10. Fresh Deciduous Forest
a. Red Oak
b. **Red Oak - Sugar Maple** - Red Maple
c. **Red Oak** - Sugar Maple - Red Maple
d. Red Oak - Red Maple
11. Successional Deciduous Forest
a. Large-toothed Aspen
b. Large-toothed Aspen - Red Maple
c. Trembling Aspen
d. Trembling Aspen - Black Cherry
e. Trembling Aspen - Red Maple
f. Trembling Aspen - White Birch
g. White Birch
h. **White Birch** - Red Oak
i. **White Birch** - Sugar Maple - White Ash - Black Cherry
j. **White Birch** - Large-toothed Aspen
k. Black Cherry
l. Manitoba Maple
12. Moist Mixed Forest
a. **Eastern Hemlock** - Sugar Maple - Beech - Red Maple
b. **Eastern Hemlock** - Sugar Maple - Beech
c. **Eastern Hemlock** - Red Maple - Beech
d. **Sugar Maple - Beech** - Eastern Hemlock
13. Fresh Mixed Forest
a**.** **Red Oak** - White Pine - Red Maple
b. **Red Maple** - White Pine - Sugar Maple
14. Mixed Successsional Forest
a. **White Pine** - White Ash
b. White Pine - Trembling Aspen
c. Eastern Hemlock - White Birch
15. Moist Conifer Forest
a. Eastern Hemlock
b**.** White Cedar

Human-influenced (Cultural) Community Types

16. Regenerating Field
8. Thicket: Staghorn Sumac
17. Conifer Plantation
18. Abandoned Sand Borrow Pit

Flora

The Maple Uplands & Kettle Wetlands ANSI supports a high diversity of 433 vascular plant species (437 taxa) (Appendix A), with a large concentration of significant flora. There is the provincially endangered American Ginseng, the provincially rare Slender Sedge and Sharp-leaved Goldenrod and 34 locally rare species (Table 2). Locally rare species are those that are considered rare in site district 6E7, an area centred on the Oak Ridges Moraine (Varga et al 2000).

These rare species occur in a wide variety of habitats including upland deciduous and mixed forests, forest edges, wetlands and dry sandy fields.

The population size, distribution and status of the ANSI's significant species are noted:

Provincially Endangered:

Panax quinquefolium **American Ginseng**
A population of seven plants occurs on moist Sugar Maple slope forests in the ANSI. Although widespread in southern Ontario, American Ginseng has been noted as an endangered species because its numbers are threatened by harvesting for its presumed medicinal properties (White 1987). Several of the GTA stations for Ginseng have since disappeared and its numbers appear to be declining in our region.

Provincially Rare:

Carex gracilescens **Slender Sedge**
Several clumps were found in a moist Sugar Maple upland forest in the southwest portion of the ANSI. This sedge is restricted to rich forests in southernmost Ontario.

Solidago arguta **Sharp-leaved Goldenrod**
Anthony Goodban (Ecoplans 1999) found several clumps in a drier Red Oak dominated forest in the southeastern portion of the ANSI around the abandoned borrow pit. This goldenrod is restricted to southern Ontario where it prefers drier oak forests and savannahs.

Locally Rare:

Alopecurus aequalis **Short-awned Foxtail**
This aquatic grass was found in several kettle wetlands in the northern portion of the ANSI.

Arabis glabra **Tower Mustard**
This mustard was found on a dry sandy site near the abandoned borrow pit.

Aronia prunifolia **Chokeberry**
This northern shrub is confined to a kettle wetland in the northwestern portion of the ANSI. It is largely restricted to kettle peatlands on the Oak Ridges Moraine. It is rare to uncommon in southern Ontario south of the Shield.

Asclepias exaltata **Poke Milkweed**
Several plants were found in dry mesic Red Oak upland forests in the southeast portion of the ANSI around the abandoned borrow pit. Poke Milkweed is restricted to southern Ontario and is rare on the Oak Ridges Moraine, which is near it northern limits.

Botrychium dissectum **Dissected Grape Fern**
Several dozen plants were found in a conifer plantation in the west-central portion of the ANSI.

Calystegia spithamea **Low Bindweed**
Patches of this bindweed are scattered along the edges of drier oak forests, particularly around the abandoned borrow pit.

Carex backii **Back's Sedge**
Three clumps of this sedge were found in a dry mesic Red Oak forest, a moist Sugar Maple forest and a mixed Sugar Maple - Hemlock forest. Back's Sedge is considered rare to uncommon in most of the counties of southern Ontario.

Carex cephalophora **Oval-leaf Sedge**
Several clumps of this southern sedge occur in successional upland forests and a conifer plantation in the northwest portion of the ANSI.

Carex digitalis **Finger Sedge**
A number of clumps of Finger Sedge occur in a variety of habitats in the ANSI including a cleared forest, dry mesic Red Oak forests and moist Sugar Maple forests. This sedge is confined to southernmost Ontario.

Carex molesta **Troublesome Sedge**
This southern sedge is confined to a dry mesic forest edge in the center of the ANSI.

Carex tonsa **Red-seeded Sedge**
Red-seeded Sedge is confined to several clumps on the edge of dry mesic Red Oak forests in the eastern portion of the ANSI (Lots 30, 31, Conc. 2). This sedge is rare or uncommon in most counties in southern Ontario.

Chamaedaphne calyculata **Leatherleaf**
This classic shrub of kettle bogs on the Oak Ridges Moraine was collected by Margaret Heimburger in 1959 in a kettle wetland abutting Dufferin Street in the northern portion of the ANSI. This shrub is rare to uncommon in southern Ontario south of the Shield.

Claytonia virginica **Narrow-leaved Spring Beauty**
This southern species is a spring wildflower in the moister Sugar Maple forests.

Conopholis americana **Squaw-root**
This parasite on the roots of oak trees is known from only one clump in a moist Sugar Maple slope forest in the northeast portion of the ANSI. Squaw-root is rare or uncommon in many of the counties in southern Ontario.

Cyperus lupulinus **Slender-stemmed Cyperus**
This sedge is confined to a small dry sandy opening in the southwestern portion of the ANSI. Slender-stemmed Cyperus is restricted to southern Ontario and is rare or uncommon in many of the counties.

Dulichium arundinaceum **Three-way Sedge**
This northern sedge dominates a small kettle wetland on thick peats in the northeast portion of the ANSI. It is rare or uncommon in southern Ontario south of the Shield.

Equisetum variegatum **Variegated Horsetail**
This horsetail dominates the edges of a kettle wetland on the kettle floor in the east-central portion of the ANSI. It occurs in association with Alpine Rush, another locally rare species. The horsetail is also found around a pond in the southwest part of the ANSI.

Euonymus obovatus **Running Strawberry-bush**
This southern sprawling shrub is confined to a moist Sugar Maple forest in the southwestern portion of the ANSI. It is near the limit of its range here, and is one of the few records for this species on the Oak Ridges Moraine

Glyceria canadensis **Rattlesnake Manna Grass**
This grass was found for the first time in York and Metropolitan Toronto during this study. It is confined to kettle wetlands in the northwest portion of the ANSI. It is uncommon to rare in most counties in southern Ontario.

Glyceria septentrionalis **Eastern Manna Grass**
This grass is confined to kettle wetlands in the northwest portion of the ANSI. Eastern Manna Grass is restricted to southern Ontario wetlands.

Hamamelis virginiana **Witch-hazel**
Our only autumn flowering shrub, this southern species is common in the drier oak forests of the ANSI. It is near the limits of its range on the Oak Ridges Moraine.

Hepatica americana **Round-lobed Hepatica**
This woodland herb is one of the earliest bloomers in drier oak forests of the ANSI.

Juncus alpinoarticulatus **Alpine Rush**
This rush is confined to a kettle wetland on the kettle floor in the east-central portion of the ANSI.

Liparis loeselii **Loesel's Twayblade**
This orchid is restricted to a kettle wetland that supports a deciduous swamp in the northwestern portion of the ANSI.

Lycopodium hickeyi **Hickey's Tree Clubmoss**
This clubmoss occurs in scattered clumps through the ANSI. It is found in moist Sugar Maple forests and drier Red Oak forests.

Osmorhiza longistylis **Long-styled Sweet Cicely**
This woodland herb was collected by Margaret Heimburger in 1950 and is typically found in moist deciduous forests.

Osmunda clatyoniana **Interrrupted Fern**
This fern was observed in a moist Sugar Maple forest in the northeastern portion of the ANSI.

Panicum linearifolium **Linear-leaved Panic Grass**
This grass is confined to several clumps on the edge of dry mesic Red Oak forests in the southeastern portion of the ANSI around the abandoned borrow pit.

Pilea fontana **Spring Clearweed**
Spring Clearweed is confined to a meadow marsh in the northeast portion of the ANSI and to a conifer swamp in the southwest portion. It is rare or uncommon in many counties in southern Ontario.

Potentilla palustris **Marsh Cinquefoil**
Marsh Cinquefoil is restricted to several kettle wetlands in the northern portion of the ANSI.

Shepherdia canadensis **Soapberry**
Margaret Heimburger collected this shrub in 1954 and it typically prefers drier oak forest edges.

Utricularia vulgaris **Common Bladderwort**
This submerged aquatic plant was found in a kettle wetland in the northern portion of the ANSI.

Viburnum alnifolium **Hobblebush**
Several shrubs occur on a cooler northfacing moist slope of Eastern Hemlock and Sugar Maple in the southeastern portion of the ANSI. This Appalachian species is uncommon to rare in southwestern Ontario and is common on the Shield in the Algonquin Park and Muskoka areas.

Wolffia columbiana **Columbian Water-meal**
This floating aquatic is the world's smallest flowering plant. It forms a dense floating mat in one of the kettle wetlands in the ANSI.

Table 2. Significant vascular plants

Status: Pe - Provincially endangered, Pr - Provincially rare; L - Locally rare in site district 6E7 centred on the Oak Ridges Moraine (based on Varga et al 2000). Source: 1984, 1995, 1998 fieldwork by S. Varga (84, 95, 98); herbarium specimen at the Royal Ontario Museum Vascular Plant Herbarium (T-TRT); 1999 (99) fieldwork by Anthony Goodban (Ecoplans 1999) and the collections of Margaret Hiemburger in 1950 (50), 1954 (54) and 1959 (59).

PeL	*Panax quinquefolium* American Ginseng	T95
PrL	*Carex gracilescens* Slender Sedge	T95
PrL	*Solidago arguta* Sharp-leaved Goldenrod	99
L	*Alopecurus aequalis* Short-awned Foxtail	T95
L	*Arabis glabra* Tower Mustard	95
L	*Aronia prunifolia* Chokeberry	T95
L	*Asclepias exaltata* Poke Milkweed	95
L	*Botrychium dissectum* Dissected Grape Fern	T95
L	*Calystegia spithamea* Low Bindweed	95
L	*Carex backii* Back's Sedge	T95
L	*Carex cephalophora* Oval-leaf Sedge	T95
L	*Carex digitalis* Finger Sedge	T95
L	*Carex molesta* Troublesome Sedge	T95
L	*Carex tonsa* Red-seeded Sedge	T95
L	*Chamaedaphne calyculata* Leatherleaf	T59
L	*Claytonia virginica* Narrow-leaved Spring Beauty	T84
L	*Conopholis americana* Squaw-root	T95
L	*Cyperus lupulinus* Slender-stemmed Cyperus	T95
L	*Dulicuuim arundinaceum* Three-way Sedge	T95
L	*Equisetum variegatum* Variegated Horsetail	T95
L	*Euonymus obovatus* Running Strawberry-bush	T95
L	*Glyceria canadensis* Rattlesnake Manna Grass	T95
L	*Glyceria septentrionalis* Eastern Manna Grass	T95
L	*Hamamelis virginiana* Witch-hazel	95, 98
L	*Hepatica americana* Round-lobed Hepatica	T84
L	*Juncus alpinoarticulatus* Alpine Rush	T95
L	*Liparis loeseli* Loesel's Twayblade	95
L	*Lycopodium hickeyi* Hickey's Tree Club-moss	T95
L	*Osmunda claytoniana* Interrupted Fern	95
L	*Osmorhiza longistylis* Long-styled Sweet Cicely	T50
L	*Panicum linearifolium* Linear-leaved Panic Grass	T95
L	*Pilea fontana* Spring Clearweed	95
L	*Potentilla palustris* Marsh Cinquefoil	95
L	*Shepherdia canadensis* Soapberry	T54

L	*Utricularia vulgaris* Common Bladderwort	95
L	*Viburnum alnifolium* Hobbebush	95, T52
L	*Wolffia columbiana* Columbian Water-meal	95

The flora of the ANSI is noteworthy for its intermixing of northern and southern species. Forty-nine species have northern affinities (Table 3). Their ranges terminate just south of the lower Great Lakes and occasionally extend further south along the Appalachian Mountains. They range north into the boreal and even subarctic regions of Canada, with many having a circumboreal distribution (i.e. they are also present in the boreal regions of Eurasia). These include such boreal species as Tamarack (*Larix laricina*), Trembling Aspen (*Populus tremuloides*) Blue-bead Lily (*Clintonia borealis*) and Naked Mitrewort (*Mitella nuda*).

Fifty-two species with southern affinities also occur in the ANSI. These include such species as Finger Sedge (*Carex digitalis*), Slender Sedge (*Carex gracilescens*), Eastern Cottonwood (*Populus deltoides*), Witch-hazel (*Hamamelis virginiana*) and Running Strawberry-bush (*Euonymus obovatus*). These species are at or near their northern range limits in the ANSI.

Table 3. Geographic affinities of selected vascular plants

Species with northern affinities

Boreal and subarctic species ranging south to the Lower Great Lakes into Ohio and Pennsylvania, and sometimes with an extension into the Appalachian Mountains. Distributions are based on Hulten 1968, Riley 1989, Riley unpublished data, Oldham 1993, Johnson 1990, Morton & Venn 1984 and other sources.

Actaea rubra
Alopecurus aequalis
Aralia nudicaulis
Betula papyrifera
Calla palustris
Calystegia spithamea
Carex backii
Carex bebbii
Carex deweyana
Carex disperma
Carex leptalea
Carex prairea
Carex utriculata
Chamaedaphne calyculata
Cicuta bulbifera
Cinna latifolia
Circaea alpina
Clintonia borealis
Coptis trifolia
Cornus rugosa
Epilobium ciliatum
Equisetum scirpoides
Equisetum fluviatile
Equisetum variegatum
Galium trifidum
Geum aleppicum
Gymnocarpium dryopteris
Junus alpinoarticulatus
Juncus nodosus
Larix laricina
Lysimachia thyrsiflora
Mitella nuda
Pinus strobus
Poa palustris
Polygala paucifolia
Populus balsamifera
Populus temuloides
Ribes triste
Potentilla palustris
Prunus pensylvanica
Salix bebbiana
Sambucucs pubens
Schizachne purpurascens
Sisyrinchium montanum
Streptopus roseus
Thuja occidentalis
Trientalis borealis
Viburnum alnifolium
Viola macloskeyi

Species with southern affinities

Southern species with their northern range limits on the Bruce Peninsula or ranging north in Ontario to Manitoulin Island and often extending into the southern portion of the Canadian Shield to Algonquin Park or rarely to North Bay. Species at or near the limit of their range in the ANSI are noted with an asterisk.

Amphicarpa bracteata
Amelanchier arborea
Asclepias exaltata
Aster cordifolius
Boehmeria cylindrica
Carex blanda
Carex cephalophora
Carex convoluta
Carex cristatella
Carex digitalis *
Carex gracilescens *
Carex laevivaginata
Carex laxiflora
Carex lupulina
Carex molesta
Carex platyphylla
Carex sparganioides
Carpinus caroliniana
Carya cordiformis
Crataegus pedicellata
Crataegus punctata
Desmodium glutinosum
Echinocystis lobata
Euonymus obovatus *
Eupatorium rugosum
Festuca verticillata
Galium lanceolatum
Geum canadense
Glyceria septentrionalis
Hamamalis virginiana *
Anemone acutiloba
Hydrophyllum virginianum
Mitella diphylla
Panax quinquefolium
Pilea fontana
Pilea pumila
Podophyllum peltatum
Polysitchum acrosticoides
Populus deltoides *
Rubus occidentalis
Rubus odoratus
Salix amygdaloides
Smilax herbacea
Smilax hispida
Solidago arguta
Solidago caesia
Solidago flexicaulis
Tiarella cordifolia
Uvularia grandiflora
Viburnum acerifolium
Viola rostrata
Wolffia columbiana

Fauna

The ANSI sustains a diversity of 49 breeding bird species (Appendix B). Wild Turkey, Veery and Chestnut-sided Warbler are considered locally rare or uncommon in the TRCA watershed (Table 4). A number of bird species are also considered sensitive species by Bird Studies Canada (Couturier 1999), the Toronto and Region Conservation Authority (TRCA 1999) and the Canadian Wildlife Service (Cadman 1999) (Table 4).

The ANSI is noteworthy for its diversity of sensitive forest bird species such as Veery, Ovenbird (4 breeding pairs), Scarlet Tanager (5 breeding pairs), Wood Thrush (5 breeding pairs), Red-breasted Nuthatch, Alder Flycatcher,

American Redstart, Mourning Warbler and Chestnut-sided Warbler. Species such as Ovenbird occur in larger forested tracts and are confined to forest interior habitats (Burke 1999), while other forest species such as Mourning Warbler also occur in forest edge and shrubby habitats. Many of these sensitive forest species have suffered population declines in eastern North America, presumably due to the fragmentation of forests and the resulting reduction in forest interior habitat. Cadman (1999) has shown that in southern Ontario these forest species reach their highest diversity in areas with over 35% forest cover. Cadman has noted that the Oak Ridges Moraine, where this ANSI resides, is one of the six areas in southern Ontario with the highest diversity of forest bird species. This is probably attributable to the relatively high forest cover of 28% on the Moraine (OMNR 1999).

In the TRCA watershed a number of the forest species are considered sensitive because they have largely disappeared from urbanized areas such as the City of Toronto. This is probably attributable to high nest predation from elevated numbers of Grey Squirrels, Raccoons and domestic cats and dogs that are associated with urban areas. Declines are particularly high for ground nesters such as Ovenbird, Wood Thrush and Veery. Friesen (1995) has noted that urban development within 100 metres of a woodlot result in declines for some forest bird species

Bobolink, Field Sparrow, American Goldfinch, Bank Swallow, Vesper Sparrow, Gray Catbird and Eastern Towhee are considered sensitive species of open country and shrubby areas with a number of them experiencing declines in their North American ranges.

Alder Flycatcher and Swamp Sparrow are sensitive wetland species because they are dependent on good quality wetlands, a habitat type that has suffered large losses in southern Ontario.

Wild turkeys have recently been re-introduced to southern Ontario. It is a sensitive species in the TRCA watershed because it is a ground nester and requires well-linked habitats, which support some mature forests. Turkeys particularly prefer oak forests, their acorns being a major food source.

Incidental observations were made on other fauna. Five mammal species were observed, including Raccoon, Eastern Chipmunk, Grey Squirrel, Coyote and White-tailed Deer. Seven amphibian and reptile species were also found, including American Toad, Red-back Salamander, Green Frog, Leopard Frog, Northern Spring Peeper, Tetraploid Gray Treefrog and Wood Frog. The later three species are considered sensitive species in the TRCA watershed because they have largely disappeared from urbanized areas such as the City of Toronto (Table 4). These woodland frogs require wetlands in the spring for breeding and nearby forested habitats for feeding and hibernating. Their extirpation from urbanized areas is attributable to the loss of wetland habitats and the loss of adjacent forests and their connecting links.

Table 4. Significant fauna

Status: L - locally rare or uncommon in the TRCA watershed being known from 20 or less stations (pres. comm. Lionel Normand 1999); s – species of concern in the TRCA watershed (TRCA 1999); p1 – conservation priority forest, wetland and open country bird species for York Region ranging from conservation priority level 1 (highest) to level 4 (lowest), based on Bird Studies Canada (Couturier 1999); f – forest bird species with the highest sensitivity to forest cover in southern Ontario (Cadman 1999). Breeding bird status: P – Probable breeder, o – Possible breeder. Source: 1995 TRCA fieldwork (95).

Breeding Birds			
Ls	Wild Turkey	o	95
p2	Black-billed Cuckoo	o	95
p3	Ruby-throated Hummingbird	o	95
s	Eastern Wood-Pewee	P	95
p3f	Alder Flycatcher	P	95
p3f	Eastern Phoebe	P	95
p3	Eastern Kingbird	P	95
p2	Bank Swallow	o	95
p4	Black-capped Chickadee	o	95
p3f	Red-breasted Nuthatch	o	95
Lsp3f	Veery	P	95
p4f	Wood Thrush	o	95
p3	Gray Catbird	o	95
Lsp1f	Chestnut-sided Warbler	o	95
sp4f	Ovenbird	o	95
p2f	Mourning Warbler	o	95
p2f	American Redstart	o	95
p2f	Scarlet Tanager	o	95
sp3	Eastern Towhee	P	95
p3	Field Sparrow	o	95
p3	Vesper Sparrow	P	95
p2	Swamp Sparrow	o	95
p2	Bobolink	P	95
p3	American Goldfinch	o	95
Amphibians			
s	Wood Frog		95
s	Northern Spring Peeper		95
s	Tetraploid Gray Treefrog		95

Conclusions
The inventory work carried out re-confirms that the Maple Uplands & Kettle Wetlands is a regional life science Area of Natural and Scientific Interest and the Oak Ridges Moraine Maple Spur is a regional earth science Area of Natural and Scientific Interest.

Life Science Significance
The Maple Uplands & Kettle Wetlands ANSI fulfills the following five criteria for life science ANSI selection:

Representation
The Maple Uplands & Kettle Wetlands ANSI provides good representation of Oak Ridges Moraine natural features. These include moist deciduous and mixed upland forests, drier deciduous forests, kettle wetlands and lowland conifer swamps. It supports some of the best examples of kettle wetlands in ANSIs on the Oak Ridges Moraine. Kettle wetlands are also represented at Lake Wilcox Kettle Wetlands & Uplands ANSI, Vandorf Bog Complex ANSI and White Rose Bog ANSI. Maple Uplands & Kettle Wetlands is also noteworthy for supporting one of the most mature examples of a White Cedar – Hemlock – Yellow Birch conifer headwater swamp on the Moraine.

Diversity
The ANSI is noteworthy for its high diversity of 66 plant communities, 433 vascular plant species and 49 breeding bird species.

Special Features
The ANSI has a high concentration of 37 significant plant species, 24 significant bird species and 3 significant amphibian species. They include the provincially endangered American Ginseng and the provincially rare Slender Sedge and Sharp-leaved Goldenrod.

Condition
The ANSI's forests are largely intermediate aged to semi-mature, with some trees in excess of a hundred years old. A noteworthy mature conifer swamp has old-growth characteristics. There are also successional forests, which are reverting to forest types typical of the moraine. There has been no recent logging in most of the ANSI. An abandoned sand borrow pit in the southeast portion abuts the ANSI. Other disturbances include Dufferin Street cutting through the middle of the ANSI and a recently approved residential subdivision in the southwest portion of the kettle depression.

Ecological Function
The Oak Ridges Moraine is noted for its large tracts of sandy woodlands, the largest in the Greater Toronto Area (OMNR 1999). The Maple Uplands & Kettle Wetlands ANSI with over 300 hectares of forested and regenerating lands is one of the twelve largest forested blocks on the Moraine (OMNR 2000). The ANSI's forests are connected to the south to additional valley forests that are part of the East Don valley system. This large woodland block provides critical forest interior habitat.

The ANSI is a highly sensitive recharge and discharge area for the East Branch of the Don River. Waters percolating into the highly permeable sands of the ANSI, are discharged in the ANSI and to the south as headwater sources for the Don River watershed (Gartner Lee Ltd. 1993).

The ANSI is connected to a major natural valley corridor, the East Don. This valley provides an important ecological corridor linking the Oak Ridges Moraine to the till plain to the south. Such natural corridors play an important role in maintaining ecological functions by allowing for the genetic flow of animals and plants (Riley & Mohr 1994).

Earth Science Significance
The Oak Ridges Moraine Maple Spur ANSI is representative of kettle landforms on the Oak Ridges Moraine. The site is representative of these landforms at the regional level of significance and provides additional protection for this landform type in addition to the landforms in the Musselman Lake Kettle Complex ANSI. The fact that the depression is not water-filled, in contrast to most of the other kettles on the moraine, adds to its scientific and interpretive value. These values of the site are also considerable enhanced by the presence of a large and well-developed meltwater channel, which provides a record of an important phase in kettle development. The quality and condition of the landforms in the Maple site is good. There has been some disturbance of the landform features including an abandoned borrow pit and a recently approved residential subdivision on a portion of the kettle floor.

ANSI boundaries
The boundaries for the earth and life science ANSIs are shown on Map 1.

The life science ANSI boundary has been modified to conform more closely to the natural features of the site and to avoid several homes, a recently approved residential subdivision, the abandoned sand borrow pit and a cultivated field on the kettle floor.

A southward extension of the life science ANSI includes a major meltwater channel and discharge area. This extension

adds to the diversity of the ANSI incorporating a high quality conifer swamp and headwater source for the East Don. It also supports additional moist broadleaf, mixed and conifer upland forests.

The boundaries of the Earth Science ANSI encompass the dry kettle and meltwater channels. It is largely confined within the life science ANSI with one exception. The cultivated field which is excluded from the life science ANSI is included in the earth science ANSI because it provides representation of the hummocky landform of the kettle floor.

Recommendations

It is recommended that no further development occur in the ANSI and appropriate buffers be set aside to ensure that ANSI functions are maintained.

The existing cultivated field, the abandoned sand borrow pit and the regenerating fields provide important corridor functions. Encouragement should be given to forest regeneration on these lands, thereby greatly increasing the amount of forest interior habitat.

The corridor connecting the ANSI's morainal forests and kettle wetlands to the East Don valley system needs to be maintained and strengthened.

Natural corridors also need to be maintained and protected between the ANSI and the surrounding kettle wetlands. These wetlands are largely situated in the northern portion of the ANSI with one isolated wetland also to the west. They serve as critical breeding grounds for the ANSI's amphibian populations such as its Spring Peepers Gray Treefrogs and Wood Frogs. These amphibians utilize the ANSI's forests for feeding and hibernating but need to migrate to the wetlands every spring for breeding. The resulting young then migrate back to the forests when they have matured.

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APPENDIX A:
VASCULAR PLANTS OF THE MAPLE UPLANDS & KETTLE WETLANDS AREA OF NATURAL AND SCIENTIFIC INTEREST

A total of 434 species (437 taxca) have been recorded in the Maple Uplands & Kettle Wetlands ANSI. There are 347 native taxa and 90 taxa have been introduced, and are so noted with the symbol "+", along the left margin. These introduced species constitute 20% of the flora. The botanical names generally follow Newmaster et al. 1998.

Other status symbols indicate species that are provincially rare (Pr), provincially endangered (Pe) and locally rare (L). A species is considered locally rare if it is known from 20 or less locations in site district 6E7. The site district is centred on the Oak Ridges Moraine, the abutting South Slope and a portion of the Niagara Escarpment and adjacent Horseshoe Moraines from central Halton Region north to central Simcoe Region.

Voucher specimens and sight records (SR) are based on the following sources: SV - Steve Varga (1995, 1996 and 1998 field seasons and a 1984 visit with Sheila McKay-Kuja), AG - Anthony Goodban's 1999 field notes for Lot 30, Concession 2 (Ecoplans 1999) and MH - Margaret L. Heimburger (collections in the 1950s). Species based on voucher specimens are noted by the herbarium they are housed in: TRT - Royal Ontario Museum, Botany Department and the year of the collection. The vegetation community types in which they are found are noted for most species. They are based on community numbers in the text.

Status	Species	Common Name	Community Types	Source
	LYCOPODIACEAE	**CLUBMOSS FAMILY**		
	Diphasiastrum digitatum (Dill. Ex A. Braun) Holub (*Lycopodium digitatum* Dill ex A. Braun.)	Crowfoot Clubmoss	11	SV(TRT84,95)
	Huperzia lucidula (Michx.) Trevis. (*Lycopodium lucidulum* Michx.)	Shining Clubmoss	9,12	SV(SR)
L	*Lycopodium hickeyi* W.H. Wagner, Beitel & Moran (*L. obscurum* L. var. *isophyllum* Hickey)	Hickey's Tree Club-moss	9,10,11,12	SV(TRT84,95)
	EQUISETACEAE	**HORSETAIL FAMILY**		
	Equisetum arvense L.	Field Horsetail	2,3,4,5,6,7,9,16	SV(SR)
	Equisetum fluviatile L.	Water Horsetail	2,4,5	SV(SR)
	Equisetum hyemale L. var. *affine* (Engelm.) A.A. Eat.	Common Scouring-rush	9,10,11	SV(SR)
	Equisetum scirpoides Michx.	Dwarf Scouring-rush	6,7,12	SV(TRT84)
	Equisetum variegatum Schleich.	Variegated Horsetail	3	SV(TRT95)
	OPHIOGLOSSACEAE	**ADDER'S-TONGUE FAMILY**		
L	*Botrychium dissectum* Spreng.	Dissected Grape Fern	17	SV(TRT95)

Status	Species	Common Name	Community Types	Sources
	Botrychium virginianum (L.) Sw.	Rattlesnake Fern	9,10,11,12,13	SV(SR)
	OSMUNDACEAE	**ROYAL FERN FAMILY**		
	Osmunda cinnamomea L.	Cinnamon Fern	4	SV(SR)
L	*Osmunda claytoniana* L.	Interrupted Fern	9	SV(SR)
	DENNSTAEDTIACEAE	**BRACKEN FAMILY**		
	Pteridium aquilinum (L.) Kuhn var. *latiusculum* (Desv.) Underw.	Eastern Bracken	8,10,11,13,14,16,17	SV(SR)
	ADIANTACEAE	**MAIDENHAIR FERN FAMILY**		
	Adiantum pedatum L.	Northern Maidenhair Fern	6,9,12	SV(SR)
	ASPLENIACEAE	**SPLEENWORT FAMILY**		
	Athyrium filix-femina (L.) Roth var. *michauxii* (Spreng.) Fern. (*A. angustum* (Willd.) Presl. var. *angustum*)	Northeastern Lady Fern	7,9,10,11,12,13,15	SV(SR)
	Cystopteris bulbifera (L.) Bernh.	Bulblet Fern	3,6,7,12,14,15	SV(SR)
	Dryopteris carthusiana (Vill.) H.P. Fuchs (*D. spinulosa* (O.F. Muell.) Watt; *D. austriaca* (Jacq.) Woynar var. *spinulosa* (O.F. Muell.) Fiori)	Spinulose Wood Fern	5,6,7,9,11,12,15	SV(SR)
	Dryopertis clintoniana (D.C. Eat) Dowell (*D. cristata* (L.) Gray var. *clintoniana* (D.C. Eat) Underw.)	Clinton's Wood Fern	9	MH(TRT84)
	Dryopteris cristata (L.) Gray	Crested Wood Fern	3	SV(TRT95)
	Dryopteris intermedia (Willd.) Gray (*D. spinulosa* (O.F. Muell.) Watt. var. *intermedia* (Willd.) Underw.) (*D. austriaca* (Jacq.) Woynar var. *intermedia* (Willd.) Mort.)	Glandular Wood Fern	7,9,10,11,12,13,15	SV(SR)
	Dryopteris marginalis (L.) Gray	Marginal Wood Fern	7,9,10,12,13,15	SV(SR)
	Dryopteris X *triploidea* Wherry (*D. intermedia* X *D.carthusiana*) (*D. austriaca* (Jacq.) Woynar var. *fructuosa* (Gilb.) Mort.) (*D. spinulosa* (O.F. Muell.) Watt. var. *fructuosa* (Gilb.) Trud.)	Triploid Wood Fern	9,12	SV(SR)

Status	Species	Common Name	Community Types	Sources
	Gymnocarpium dryopteris (L.) Newm. (*Dryopteris disjuncta* (Ledeb.) Mort.)	Oak Fern	6,7,12,15	SV(SR), MH(TRT52)
	Matteuccia struthiopteris (L.) Todaro var. *pensylvanica* (Willd.) Mort. (*Pteretis pensylvanica* (Willd.) Fern.)	American Ostrich Fern	3,4,5,6,7,9,12	SV(SR)
	Onoclea sensibilis L.	Sensitive Fern	2,3,4,5,6,7,15	SV(SR)
	Polystichum acrostichoides (Michx.) Schott	Christmas Fern	9,12,15	SV(SR)
	THELYPTERIDACEAE	**BEECH FERN FAMILY**		
	Thelypteris palustris (Salisb.) Schott var. *pubescens* (Lawson) Fern. (*Dryopteris thelypteris* (L.) Gray var. *pubescens* (Lawson) Nakai)	Marsh Fern	2,3,4,5,6,7	SV(SR),MH(TRT52)
	POLYPODIACEAE	**POLYPODY FAMILY**		
	Polypodium virginianum L.	Rock Polypody Fern	10	AG(SR)
	PINACEAE	**PINE FAMILY**		
	Larix laricina (Du Roi) K. Koch	Tamarack	4,17	SV(SR)
+	*Picea glauca* (Moench) Voss	White Spruce	11,17	SV(SR)
+	*Pinus banksiana* Lam.	Jack Pine	17	SV(SR)
+	*Pinus resinosa* Ait.	Red Pine	17	SV(SR)
	Pinus strobus L.	White Pine	7,9,10,11,12,13,14,15,16,17	SV(TRT84)
	Tsuga canadensis (L.) Carr.	Eastern Hemlock	6,7,9,10,11,12,14,15	SV(SR)
	CUPRESSACEAE	**CYPRESS FAMILY**		
	Thuja occidentalis L.	White Cedar	5,6,7,15	SV(SR)
	TYPHACEAE	**CATTAIL FAMILY**		
	Typha angustifolia L.	Narrow-leaved Cattail	3	SV(SR)
	Typha latifolia L.	Common Cattail	2,4,5	SV(SR)
	SPARGANIACEAE	**BUR-REED FAMILY**		
	Sparganium chlorocarpum Rydb. (*S. emersum* Rehman ssp. *emersum*)	Green-fruited Bur-reed	1,2	SV(TRT95)

Status	Species	Common Name	Community Types	Sources
	ZOSTERACEAE	**PONDWEED FAMILY**		
	Potamogeton foliosus Raf.	Leafy Pondweed	1	SV(TRT95)
	ALISMATACEAE	**WATER-PLANTAIN FAMILY**		
	Alisma plantago-aquatica L. (incl. *A. triviale* Pursh & *A. subcordatum* Raf.)	Water-plantain	1,2,4,5	SV(SR)
	Sagittaria latifolia Willd.	Common Arrowhead	2	SV(SR)
	POACEAE	**GRASS FAMILY**		
+	*Agropyron repens* (L.) Beauv. (*Elymus repens* (L.) Gould)	Quack Grass	16	SV(SR)
+	*Agrostis gigantea* Roth. (*A. alba auct. amer.*, *non* L.)	Redtop	3,16	SV(SR)
	Agrostis stolonifera L. (*A. alba* L. var. *palustris* (Huds.) Pers.)	Creeping Bent Grass	3	SV(SR)
L	*Alopecurus aequalis* Sobol	Short-awned Foxtail	2,3,4,5	SV(TRT95)
+	*Bromus inermis* Leyss. ssp. *inermis*	Smooth Brome Grass	8,11,16,17	SV(SR)
+	*Bromus japonicus* Murray	Japanese Brome	16,18	SV(TRT95)
	Cinna latifolia (Goepp.) Grisep.	Nodding Wood Grass	7	SV(SR)
+	*Dactylis glomerata* L.	Orchard Grass	8,11,16,17	SV(SR)
	Danthonia spicata (L.) R. & S.	Poverty Oat Grass	17	SV(SR)
+	*Digitaria ischaemum* (Schreb.) Schreb. *ex* Muhl.	Smooth Crabgrass	16	SV(SR)
	Festuca subverticillata (Pers.) & Alexeev (*F. obtusa* Biehl.)	Nodding Fescue	6,9,12	SV(TRT95)
+	*Festuca pratensis* Huds. (*F. elatior* L. *pro parte*)	Meadow Fescue	16	SV(SR)
L	*Glyceria canadensis* (Michx.) Trin.	Rattlesnake Manna Grass	2,4	SV(TRT95)
	Glyceria grandis S. Wats.	Tall Manna Grass	2,4	SV(SR)
L	*Glyceria septentrionalis* A.S. Hitchc.	Eastern Manna Grass	2,4,5	SV(TRT95)
	Glyceria striata (Lam.) A.S. Hitchc.	Fowl Manna Grass	3,4,5,6,7,9	SV(SR)

Status	Species	Common Name	Community Types	Sources
+	*Hordeum jubatum* L.	Foxtail Barley	18	SV(TRT)
	Leersia oryzoides (L.) Sw.	Rice Cut Grass	2,3,4,7	SV(SR)
+	*Lolium perenne* L. (incl. *L. multiflorum* Lam.)	Perennial Rye-grass	16	SV(TRT95)
	Milium effusum L.	Wood Millet	9	SV(SR)
	Oryzopsis asperifolia Michx.	Rough-leaved Mountain-rice	9,11,12,13,14,15,17	SV(TRT84)
	Panicum lanuginosum Ell. var. *implicatum* (Scribn.) Fern. (*P. implicatum* Scribn.)	Hairy Panic Grass	9,16	SV(TRT95)
L	*Panicum linearifolium* Britt. (*Dichanthelium l.* (Scribn.) Gould)	Narrow-leaved Panic Grass	9,16	SV(TRT95)
	Phalaris arundinacea L.	Reed Canary Grass	2,3,4,5,7	SV(SR)
	Phragmites australis (Cav.) Trin. ex. Steud. (*P. communis* Trin.)	Common Reed	2	SV(SR)
+	*Phleum pratense* L.	Timothy	8,11,16,18	SV(SR)
	Poa compressa L.	Canada Blue Grass	8,11,14,16,18	SV(SR)
	Poa palustris L.	Fowl Meadow Grass	2,3,4	SV(SR)
+	*Poa pratensis* L.	Kentucky Blue Grass	8,11,14,16,17,18	SV(SR)
+	*Puccinellia distans* (Jacq.) Parl.	Alkali Grass	18	SV(TRT95)
	Schizachne purpurascens (Torr.) Sw.	Purple Melic Grass	10,11	SV(TRT84)
+	*Setaria glauca* (L.) Beauv.	Yellow Foxtail	16	SV(SR)
+	*Setaria viridis* (L.) Beauv.	Green Foxtail	16	SV(SR)
	Sphenopholis intermedia (Rydb.) Rydb.	Slender Wedge Grass	3	SV(SR)
	Sporobolus cryptandrus (Torr.) Gray	Sand Dropseed	16,18	SV(SR)
	CYPERACEAE	**SEDGE FAMILY**		
	Carex arctata Boott	Drooping Wood Sedge	9,10,11,12,14,15,16	SV(TRT95),MH(TRT52)
L	*Carex backii* Boott	Back's Sedge	10,12,13	SV(TRT95)
	Carex bebbii (Bailey) Fern.	Bebb's Sedge	2,3,4	SV(TRT95)
	Carex blanda Dew.	Woodland Sedge	9,10,11,12	SV(TRT84,95)

Status	Species	Common Name	Community Types	Sources
L	*Carex cephalophora* Muhl. *ex* Willd.	Oval-headed Sedge	11,18	SV(TRT95)
	Carex communis Bailey	Fibrous Rooted Sedge	9,10,11,12,16	SV(TRT84,95)
	Carex comosa Boott	Bearded Sedge	1,2,4	SV(TRT95)
	Carex crinita Lam.	Fringed Sedge	4	SV(TRT95)
	Carex cristatella Britt.	Crested Sedge	2,3,4,5,7	SV(TRT95)
	Carex deweyana Schw.	Dewey's Sedge	9,10,11,12,16	SV(TRT84,95), MH(TRT52)
	Carex diandra Schrank	Lesser Panicled Sedge	2,4	SV(TRT95)
L	*Carex digitalis* Willd.	Finger Sedge	9,10,11,12,16	SV(TRT95)
	Carex disperma Dewey	Soft-leaved Sedge	7	SV(SR)
PrL	*Carex gracilescens* Steud. (*C. laxiflora* Lam. var. *gracillima* Robins. & Fern.)	Slender Sedge	9	SV(TRT95)
	Carex gracillima Schw.	Graceful Sedge	6,12	SV(SR)
	Carex granularis Muhl. *ex* Willd.	Meadow Sedge	16	SV(SR)
	Carex hystericina Muhl. *ex* Willd.	Porcupine Sedge	2,3,4,7	SV(SR)
	Carex interior Bailey	Inland Sedge	7	SV(SR)
	Carex intumescens Rudge	Bladder Sedge	4,5,6,9,12	SV(SR)
L	*Carex laevivaginata* (Kukenth.) Mack.	Smooth-sheathed Sedge	2,3	SV(SR),MH(TRT52)
	Carex laxiflora Lam.	Loose-flowered Sedge	9,10,11,12,13	SV(TRT95),MH(TRT52)
	Carex leptalea Wahl.	Bristle-stalked Sedge	7	SV(SR)
	Carex lupulina Muhl. *ex* Willd.	Hop Sedge	2,3,4,5	SV(TRT95)
L	*Carex molesta* Mack. *ex* Bright (*C. brevior* (Dew.) Mack. *ex* Lunnell var. *molesta* (Mack.) Gates)	Troublesome Sedge	16	SV(TRT95)
	Carex pedunculata Muhl. *ex* Willd.	Peduncled Sedge	7,9,10,11,12,13,14,15	SV(SR)
	Carex pensylvanica Lam.	Pennsylvania Sedge	9,10,11,12,13,14,17	SV(TRT95)
	Carex plantaginea Lam.	Pantain-leaved Sedge	9	MH(TRT52)
	Carex platyphylla Carey	Broad-leaved Sedge	10	MH(TRT52)
	Carex projecta Mack.	Necklace Sedge	2,3,4,5,9	SV(TRT95)

Status	Species	Common Name	Community Types	Sources
	Carex pseudocyperus L.	Cyperus-like Sedge	1,2,3,4	SV(SR)
	Carex radiata (Wahlenb.) Small (*C. rosea* auct.)	Straight-styled Wood Sedge	6,9,12	SV(SR)
	Carex retrorsa Schw.	Retrorse Sedge	2,3,4	SV(TRT95)
	Carex rosea Schkuhr ex Willd. (*C. convoluta* Mack.)	Curly-styled Wood Sedge	9,10,11,12,16	SV(TRT95)
	Carex scabrata Schwein.	Rough Sedge	7	SV(SR)
	Carex sparganioides Muhl. *ex* Willd.	Bur-reed Sedge	9,11,12	SV(TRT95)
+	*Carex spicata* Huds.	Spiked Sedge	16	SV(SR)
	Carex stipata Muhl. *ex* Willd.	Awl-fruited Sedge	2,3,4,7	SV(TRT95)
L	*Carex tonsa* (Fern.) Bicknell *(C. rugosperma* Mack.)	Red-seeded Sedge	9,16	SV(TRT95)
	Carex utriculata Boott (*C. rostrata* of authors)	Beaked Sedge	2	SV(TRT95)
	Carex vulpinoidea Michx. (incl. *C. annectans* (Bickn.) Bickn.)	Fox Sedge	3	SV(SR)
L	*Cyperus lupulinus* (Spreng.) Marcks (part of *Cyperus filiculmis* Vahl.)	Slender Cyperus	16	SV(SR)
L	*Dulichium arundinaceum* (L.) Britt.	Three-way Sedge	2	SV(SR)
	Eleocharis erythropoda Steud. (*E. calva* Torr.)	Red-footed Spike-rush	1,2	SV(TRT95)
	Eleocharis obtusa (Willd.) Schultes	Blunt Spike-rush	3	SV(TRT95)
	Scirpus atrovirens Willd.	Dark Green Bulrush	3,7	SV(SR)
	Scirpus cyperinus (L.) Kunth var. *cyperinus*	Wool-grass	3,4	SV(SR)
	Scirpus validus Vahl	Softstem Bulrush	3	SV(SR)
	ARACEAE	**ARUM FAMILY**		
	Arisaema triphyllum (L.) Schott	Jack-in-the-pulpit	7,9,10,11,12,13,15,17	SV(SR)
	Calla palustris L.	Water-arum	2,3,4	SV(SR)
	LEMNACEAE	**DUCKWEED FAMILY**		
	Lemna minor L.	Common Duckweed	1,2,4,5	SV(SR)

Status	Species	Common Name	Community Types	Sources
	Lemna trisulca L.	Star Duckweed	1,2,4	SV(SR)
	Spirodela polyrhiza (L.) Schleid.	Greater Duckweed	1,2,4	SV(SR)
L	*Wolffia columbiana* Karst.	Columbian Water-meal	1	SV(SR)
	JUNCACEAE	**RUSH FAMILY**		
	Juncus alpinoarticulatus Chaix *in* Vill. (*Juncus alpinus* Villars)	Alpine Rush	3	SV(TRT95)
	Juncus articulatus L.	Jointed Rush	3	SV(SR)
	Juncus dudleyi Wieg.	Dudley's Rush	3	SV(SR)
	Juncus effusus L. ssp. *solutus* (Fern. & Wieg.) Hamet-Ahti (*J. effusus* L. var. *solutus* Fern. & Wieg.) (*J. griscomii* Fern.)	Soft Rush	2,3,4	SV(TRT95)
	Juncus nodosus L.	Knotted Rush	3	SV(SR)
	Juncus tenuis Willd.	Path Rush	11	SV(SR)
	LILIACEAE	**LILY FAMILY**		
	Allium tricoccum Ait	Wild Leek	9	SV(SR)
+	*Asparagus officinalis* L.	Garden Asparagus	16	SV(SR)
	Clintonia borealis (Ait.) Raf.	Bluebead-lily	9,11,12,15	SV(SR)
	Erythronium americanum Ker	Yellow Trout-lily	9,10,11,12,13,15	SV(TRT84)
	Maianthemum canadense Desf.	Wild Lily-of-the-valley	9,10,11,12,13,14,15,17	SV(SR)
	Medeola virginiana L.	Indian Cucumber-root	9,10,11,12,15	SV(SR)
	Polygonatum pubescens (Willd.) Pursh	Hairy Solomon's-seal	9,10,11,12,13,14,1,5,17	SV(SR)
	Smilacina racemosa (L.) Desf. (*Maianthemum racemosum* (L.) Link ssp. *racemosum*)	False Solomon's-seal	9,10,11,12,13,14,1,5,17	SV(SR)
	Smilax herbacea L.	Carrion-flower	9,10,11,12,17	SV(SR)
	Smilax hispida Torr. (*S. tamnoides* L. var. *hispida* (Torr.) Fern.)	Bristly Greenbrier	10,15	SV(SR)
	Streptopus roseus Michx.	Rose Twisted Stalk	6,7,9,10,11,12,13,15,17	SV(TRT84)
	Trillium erectum L.	Red Trillium	9,10,11,12,13,15	SV(SR)

Status	Species	Common Name	Community Types	Sources
	Trillium grandiflorum (Michx.) Salisb.	White Trillium	9,10,11,12,13,14,15,17	SV(SR)
	Uvularia grandiflora Sm.	Large-flowered Bellwort	9,10,11,12	SV(TRT84)
	IRIDACEAE	**IRIS FAMILY**		
	Sisyrinchium montanum Greene	Little Blue-eyed Grass	16	SV(TRT95)
	ORCHIDACEAE	**ORCHID FAMILY**		
+	*Epipactis helleborine* (L.) Crantz.	Helleborine	6,7,9-14,17	SV(SR)
L	*Liparis loeselii* (L.) Rich.	Loesel's Twayblade	5	SV(TRT95)
	SALICACEAE	**WILLOW FAMILY**		
+	*Populus alba* L.	White Poplar	16	SV(SR)
	Populus balsamifera L.	Balsam Poplar	5,6,7,11,16	SV(SR)
	Populus deltoides Marsh.	Eastern Cottonwood	16,18	SV(SR)
	Populus grandidentata Michx.	Large-toothed Aspen	8,9-17	SV(SR)
	Populus tremuloides Michx.	Trembling Aspen	5,10-18	SV(SR)
	Salix amygdaloides Anderss.	Peach-leaved Willow	4,5	SV(TRT95)
	Salix bebbiana Sarg.	Bebb's Willow	2,3,4,5,7	SV(SR)
	Salix discolor Muhl.	Pussy Willow	2,3,4,5,16	SV(SR)
	Salix eriocephala Michx. (*S. rigida* Muhl.)	Heart-leaved Willow	2,3,4,5,7	SV(SR)
	Salix exigua Nutt. (*Salix interior* Rowlee)	Sandbar Willow	16	SV(SR)
	Salix lucida Muhl.	Shining Willow	2,3,4	SV(SR)
	Salix petiolaris Sm. (*S. gracilis* Anderss.)	Slender Willow	2,3,4	SV(TRT95)
+	*Salix* X *rubens* Schrank (*S. alba* X *S. fragilis*)	Reddish Willow	2,3,4,5	SV(TRT95)
	JUGLANDACEAE	**WALNUT FAMILY**		
	Carya cordiformis (Wang.) K. Koch	Bitternut Hickory	9,10,11,12,13,14,15,17	SV(SR).MH(TRT52)
	Juglans cinerea L.	Butternut	9,10,11,12,13,15,16,17	SV(SR)

Status	Species	Common Name	Community Types	Sources
	BETULACEAE	**BIRCH FAMILY**		
	Betula alleghaniensis Britt. (*B. lutea auct.,non* Michx.)	Yellow Birch	6,7,12,15	SV(TRT84)
	Betula papyrifera Marsh.	White Birch	5,9-18	SV(SR)
	Carpinus caroliniana Walt.	Blue Beech	6,9,12	SV(SR)
	Corylus cornuta Marsh.	Beaked Hazel	9-15,17	SV(SR)
	Ostrya virginiana (Mill.) K. Koch	Ironwood	9-15,17	SV(SR)
	FAGACEAE	**BEECH FAMILY**		
	Fagus grandifolia Ehrh.	American Beech	9-15,17	SV(SR)
	Quercus alba L.	White Oak	10,17	SV(SR)
	Quercus rubra L.	Red Oak	9-17	SV(SR)
	ULMACEAE	**ELM FAMILY**		
	Ulmus americana L.	White Elm	5-11,14,16,17	SV(SR)
	URTICACEAE	**NETTLE FAMILY**		
	Boehmeria cylindrica (L.) Sw.	False Nettle	3,4,5	SV(SR)
	Laportea canadensis (L.) Wedd.	Wood Nettle	6	SV(SR)
L	*Pilea fontana* (Lunell) Rydb.	Spring Clearweed	2,3	SV(SR)
	Pilea pumila (L.) Gray	Dwarf Clearweed	2,3	SV(SR)
	Urtica dioica L. subsp. *gracilis* (Ait.) Seland. (*U. procera* Muhl.)	American Stinging Nettle	3,7	SV(SR)
	ARISTOLOCHIACEAE	**BIRTHWORT FAMILY**		
	Asarum canadense L.	Wild Ginger	9,12	SV(TRT84)
	POLYGONACEAE	**BUCKWHEAT FAMILY**		
+	*Polygonum achoreum* Blake	Striate Knotweed	16,18	SV(TRT95)

Status	Species	Common Name	Community Types	Sources
	Polygonum amphibium L. (incl. var. *stipulaceum* Coleman (*P. natans* Eat.) & var. *emersum* Michx. (*P. coccineum* Willd.))	Water Smartweed	2,4,5	SV(SR)
	Polygonum aviculare L. (*s.l.*) (incl. *P. monspeliense* L.)	Prostrate Knotweed	16,18	SV(TRT95)
	Polygonum convolvulus L. (*Bilderdkyia convolvulus* (L.) Dumort)	Wild Buckwheat	16	SV(SR)
	Polygonumn hydropiper L.	Marshpepper Smartweed	3	SV(SR)
+	*Rumex acetosella* L.	Sheep Sorrel	16,18	SV(SR)
+	*Rumex crispus* L.	Curly Dock	16	SV(SR)
+	*Rumex obtusifolius* L.	Bitter Dock	3	SV(SR)
	CHENOPODIACEAE	**SPINACH FAMILY**		
+	*Chenopodium album* L.	Lamb's-quarters	18	SV(SR)
+	*Salsola kali* L. (*S. pestifer* A. Nels.)	Russian Thistle	18	SV(SR)
	AMARANTHUS	**AMARANTH FAMILY**		
+	*Amaranthus powellii* S. Wats. (*A. retroflexus* L. var. *powellii* (S.Wats.) Boivin)	Green Pigweed	16	SV(SR)
	PORTULACACEAE	**PURSLANE FAMILY**		
	Claytonia caroliniana Michx.	Broad-leaved Spring Beauty	9,12	SV(SR)
L	*Claytonia virginica*	Narrow-leaved Spring Beauty	6	SV(TRT84)
	CARYOPHYLLACEAE	**PINK FAMILY**		
+	*Arenaria serpyllifolia* L.	Thyme-leaved Sandwort	16	SV(SR)
+	*Cerastium fontanum* Baumg. (ssp. *triviale* (Link) Jatas; *C. vulgatum* L.)	Mouse-eared Chickweed	16	SV(SR)
+	*Myosoton aquaticum* (L.) Moench (*Stellaria aquatica* (L.) Scop.)	Aquatic Chickweed	3,7	SV(TRT95)
+	*Saponaria officinalis* L.	Bouncing-bet	16	SV(SR)

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+	*Silene vulgaris* (Moench) Garcke (*S. cucubalus* Wibel)	Bladder Campion	16	SV(SR)
	RANUNCULACEAE	**CROWFOOT FAMILY**		
	Actaea pachypoda Ell. (*A. alba sensu* Bibel.)	White Baneberry	9-15,17	SV(SR)
	Actaea rubra (Ait.) Willd.	Red Baneberry	9-15,17	SV(SR)
	Anemone acutiloba (DC.) G. Lawson *(Hepatica acutiloba* DC.)	Sharp-lobed Hepatica	9,11,12	SV(TRT84)
L	*Anemone americana* (DC.) H. Hara. *(Hepatica americana* (DC.) Ker)	Round-lobed Hepatica	10,11,13	SV(TRT84)
	Anemone quinquefolia L.	Wood Anemone	9,10	SV(SR)
	Anemone virginiana L. (incl. *A. riparia* Fern.)	Thimbleweed	10,11,16,17	SV(SR)
	Aquilegia canadensis L.	Wild Columbine	10,11,12	SV(SR)
	Caltha palustris L.	Marsh-marigold	2,3,4,5,6,7	SV(TRT84)
	Coptis trifolia (L.) Salisb. (*C. groenlandica* (Oeder) Fern.)	Gold-thread	6,7,12	SV(TRT84)
	Ranunculus abortivus L.	Kidney-leaved Buttercup	9,10,11,12,13,14,15	SV(SR)
+	*Ranunculus acris* L.	Tall Buttercup	8,11,16	SV(SR)
	Ranunculus recurvatus Poir.	Hooked Buttercup	7	SV(SR)
	Thalictrum dioicum L.	Early Meadow Rue	9,10,11,12,13,14,15	SV(SR)
	BERBERIDACEAE	**BARBERRY FAMILY**		
+	*Berberis thunbergii* DC.	Japanese Barberry	11	SV(SR)
	Caulophyllum thalictroides (L.) Michx. var. *thalictroides*	Blue Cohosh	9,11,12	SV(SR)
	Podophyllum peltatum L.	May-apple	9,10,11,12	SV(SR)
	PAPAVERACEAE	**POPPY FAMILY**		
	Sanguinaria canadensis L.	Bloodroot	9,10,11,12,13	SV(SR)
	BRASSICACEAE	**MUSTARD FAMILY**		
+	*Alliaria petiolata* (Bieb.) Cavara & Grande (*A. officinalis* Andrz. *ex* Bieb.)	Garlic Mustard	9,10,11	SV(SR)

Status	Species	Common Name	Community Types	Sources
L	*Arabis glabra* (L.) Bernh.	Tower Mustard	16	SV(SR)
+	*Barbarea vulgaris* R. Br.	Yellow Rocket	16	SV(SR)
	Cardamine pensylvanica Muhl.	Pennsylvania Bitter Cress		SV(TRT95)
	Dentaria diphylla Michx. (*Cardamine d.* (Michx.) Wood)	Two-leaved Toothwort	6,9,12	SV(TRT84)
+	*Diplotaxis tenuifolia* (L.) DC.	Narrow-leaved Wall-rocket	18	SV(TRT95)
+	*Lepidium campestre* (L.) R. Br.	Field Pepper-grass	16	SV(TRT95)
+	*Lepidium densiflorum* Schrad.	Common Pepper-grass	16	SV(TRT95)
+	*Sisymbrium altissimum* L.	Tumble Mustard	18	SV(SR)
	SAXIFRAGACEAE	**SAXIFRAGE FAMILY**		
	Mitella diphylla L.	Bishop's Cap	6,7,9,10,15	SV(TRT84)
	Mitella nuda L.	Naked Mitrewort	3,6,7	SV(TRT84)
	Tiarella cordifolia L.	Foam Flower	6,7,9,15	SV(TRT84)
	GROSSULARIACEAE	**GOOSEBERRY FAMILY**		
	Ribes americanum Mill.	Wild Black Currant	3	SV(SR)
	Ribes cynosbati L.	Prickly Gooseberry	9,10,11,12,13,14,15	SV(TRT84)
+	*Ribes rubrum* L. (*R. sylvestre* (Lam.) Mert. & Koch; *R. sativum* Syme)	Garden Red Currant	11	SV(SR)
	Ribes triste Pall.	Swamp Red Currant	6,7	SV(SR)
	HAMAMELIDACEAE	**WITCH-HAZEL FAMILY**		
L	*Hamamelis virginiana* L.	Witch-hazel	9,10,11,12,13,14	SV(SR)
	ROSACEAE	**ROSE FAMILY**		
	Agrimonia gryposepala Wallr.	Tall Hairy Agrimony	8,11,17	SV(SR)
	Amelanchier arborea (Michx. f.) Fern.	Downy Juneberry	9,10,11,12,13,14,17	SV(TRT95)
	Amelanchier sanguinea (Pursh) DC. var. *sanguinea*	Roundleaf Juneberry	10,13	SV(TRT95)

Status	Species	Common Name	Community Types	Sources
L	*Aronia prunifolia* (Marsh.) Rehd. (incl. *A. melanocarpa* (Michx.) Ell.; *Pyrus floribunda* Lindley)	Chokeberry	4	SV(TRT95)
	Crataegus macracantha Lodd (C. *succulenta* Link var. *macracantha* (Loud.) Eggles.)	Large-thorned Hawthorn	10	SV(SR)
	Crataegus pedicellata Sarg.	Pedicelled Hawthorn	10,11,13,14,16	SV(SR)
	Crataegus punctata Jacq.	Dotted Hawthorn	10,13,16	SV(SR)
	Fragaria vesca L.	Woodland Strawberry	11	SV(SR)
	Fragaria virginiana Dcne.	Common Strawberry	8,10,11,14,16,17	SV(SR)
	Geum aleppicum Jacq. var. *strictum* (Ait.) Fern.	Yellow Avens	3,4,5	SV(SR)
	Geum canadense Jacq.	White Avens	8,9,10,11,12,13,14,17	SV(SR)
	Geum rivale L.	Purple Avens	7	SV(SR)
+	*Malus domestica* Borkh. (*Pyrus malus* L.; Malus pumila Miller)	Apple	11,16	SV(SR)
+	*Potentilla norvegica* L.	Rough Cinquefoil		SV(SR)
L	*Potentilla palustris* (L.) Scop.	Marsh Cinquefoil	2,4	SV(SR)
+	*Potentilla recta* L.	Rough-fruited Cinquefoil	8,11,16	SV(SR)
	Prunus pensylvanica L.f.	Pin Cherry	16	SV(SR)
	Prunus serotina Ehrh.	Black Cherry	8-15,17	SV(SR)
	Prunus virginiana L.	Chokecherry	9-15,17	SV(SR)
	Rosa blanda Ait	Smooth Wild Rose	16	SV(SR)
	Rubus allegheniensis Porter	Common Blackberry	8,11,16,17	SV(SR)
	Rubus occidentalis L.	Black Raspberry	8-15,17	SV(SR)
	Rubus odoratus L.	Purple-Flowering Raspberry	8,11,17	SV(SR)
	Rubus pubescens Raf.	Dwarf Raspberry	4,5,6,7	SV(SR)
	Rubus strigosus Michx. (*R. idaeus* L. var. *strigosus* (Michx.) Maxim.)	Wild Red Raspberry	8-17	SV(SR)
+	*Sorbus aucuparia* L. (*Pyrus aucuparia* (L.) Gaertn.)	European Mountain-ash	11	SV(SR)

Status	Species	Common Name	Community Types	Sources
	Spiraea alba DuRoi (incl. *S. latifolia* (Ait.) Borkh.)	Meadowsweet	2,3,4,5,16	SV(SR)
	Waldsteinia fragarioides (Michx.) Tratt.	Barren Strawberry	9,11,14,17	SV(TRT84)
	FABACEAE	**PEA FAMILY**		
	Amphicarpaea bracteata (L.) Fern.	Hog-peanut	9,10,11,12	SV(SR)
	Desmodium canadense (L.) DC.	Showy Tick-trefoil	11,16,17	SV(SR)
	Desmodium glutinosum (Muhl.) Wood	Pointed-leaved Tick-trefoil	9,10,11	SV(SR)
+	*Lotus corniculatus* L.	Bird-foot Trefoil	16	SV(SR)
+	*Medicago lupulina* L.	Black Medick	16,18	SV(SR)
+	*Medicago sativa* L. ssp. *sativa*	Alfalfa	16	SV(SR)
+	*Melilotus alba* Medic.	White Sweet-clover	8,16,18	SV(SR)
+	*Melilotus officinalis* (L.) Pall.	Yellow Sweet-clover	16	SV(SR)
+	*Trifolium pratense* L.	Red Clover	16,18	SV(SR)
+	*Trifolium repens* L.	White Clover	3,16,18	SV(SR)
+	*Vicia cracca* L.	Cow Vetch	8,16	SV(SR)
	GERANIACEAE	**GERANIUM FAMILY**		
	Geranium robertianum L.	Herb Robert	9,11	SV(SR)
	OXALIDACEAE	**WOOD-SORREL FAMILY**		
	Oxalis fontana Bunge (*O. stricta auct. amer.*, *non* L., *O. europaea* Jordan)	Wood-sorrel	11	SV(SR)
	POLYGALACEAE	**MILKWORT FAMILY**		
	Polygala paucifolia Willd.	Fringed Polygala	10,11,13,14	SV(SR)
	EUPHORBIACEAE	**SPURGE FAMILY**		
	Euphorbia glyptosperma Engelm.	Ridge-seeded Spurge	16,18	SV(TRT95)

Status	Species	Common Name	Community Types	Sources
	ANACARDIACEAE	**CASHEW FAMILY**		
	Rhus radicans L. ssp. *rydbergii* (Sm. ex Rydb.) McNeill (*Toxicodendron rydbergii* (Sm. *ex* Rydb.) Greene; *Rhus toxicodendron* L. var. *rydbergii* (Sm. *ex* Rydb.) Garrett)	Poison-ivy	8,10,11,13,14,16,17	SV(SR)
	Rhus typhina L.	Staghorn Sumac	8,11,14,16,17,18	SV(SR)
	AQUIFOLIACEAE	**HOLLY FAMILY**		
	Ilex verticillata (L.) Gray	Winterberry	4,5	SV(SR)
	CELASTRACEAE	**STAFF-TREE FAMILY**		
	Celastrus scandens L.	Climbing Bittersweet	10	SV(SR)
L	*Euonymus obovatus* Nutt.	Running Strawberry-bush	9	SV(TRT95),MH(TRT53)
	ACERACEAE	**MAPLE FAMILY**		
	Acer negundo L.	Manitoba Maple	5,11,16	SV(SR)
+	*Acer platanoides* L.	Norway Maple	16	SV(SR)
	Acer rubrum L.	Red Maple	5,6,7,9-17	SV(SR)
	Acer saccharum Marsh.	Sugar Maple	8-17	SV(SR)
	Acer spicatum L.	Mountain Maple	6,7,12,15	SV(SR)
	Acer X*freemanii* (*A. rubrum* X *A. saccharinum*)	Hybrid Maple	5	SV(SR)
	BALSAMINACEAE	**TOUCH-ME-NOT FAMILY**		
	Impatiens capensis Meerb. (*I. biflora* Walt.)	Spotted Jewelweed	2,3,4,5,6,7	SV(SR)
	RHAMNACEAE	**BUCKTHORN FAMILY**		
+	*Rhamnus cathartica* L.	Common Buckthorn	8,11,14,16,17	SV(SR)
	VITACEAE	**GRAPE FAMILY**		
	Parthenocissus inserta (A. Kerner) K. Fritsch (*P. vitacea* (Knerr) Hitchc.)	Virginia Creeper	9,10,11,12	SV(SR)

Status	Species	Common Name	Community Types	Sources
	Vitis riparia Michx.	Riverbank Grape	8,16	SV(SR)
	TILIACEAE	**LINDEN FAMILY**		
	Tilia americana L.	Basswood	7-15	SV(SR)
	HYPERICACEAE	**ST. JOHN'S-WORT FAMILY**		
+	*Hypericum perforatum* L.	Common St. John's-wort	8,16,17,18	SV(SR)
	Triadenum fraseri (Spach) Gl. (*Hypericum virginicum* L. var. *fraseri* (Spach) Fern.)	Marsh St. John's-wort	2,4	SV(SR)
	VIOLACEAE	**VIOLET FAMILY**		
	Viola blanda Willd.	Sweet White Violet	6,7,9,11,12,15	SV(TRT84)
	Viola canadensis L.	Canada Violet	9,12	SV(SR),MH(TRT52)
	Viola conspersa Reich.	Dog Violet	9,10	SV(TRT84)
	Viola cucullata Ait.	Marsh Violet	6	SV(TRT84)
	Viola macloskeyi F.E. Lloyd ssp. *pallens* (Banks ex DC.) M. Baker) *(V. pallens* (Banks ex DC.) Brain.	Northern White Violet	2	SV(SR)
	Viola pubescens Ait. (incl. var. *pubescens* & var. *scabriuscula* T. & G.; *pensylvanica sensu auct*., *non* Michx. var. *leiocarpa* (Fern. & Wieg.) Fern.)	Yellow Violet	9-15,17	SV(TRT84),MH(TRT51)
	Viola rostrata Pursh	Long-spurred Violet	9,10,11,12,13,14	SV(TRT84)
	Viola sororia Willd.	Woolly Blue Violet	9,12	SV(TRT84)
	THYMELAEACEAE	**MEZEREUM FAMILY**		
	Dirca palustris L.	Leatherwood	9	SV(SR)
	ELAEAGNACEAE	**OLEASTER FAMILY**		
L	*Shepherdia canadensis* (L.) Nutt.	Soapberry		MH(TRT54)
	LYTHRACEAE	**LOOSESTRIFE FAMILY**		
+	*Lythrum salicaria* L.	Purple Loosestrife	3	SV(SR)

Status	Species	Common Name	Community Types	Sources
	ONAGRACEAE	**EVENING-PRIMROSE FAMILY**		
	Circaea alpina L.	Small Enchanter's Nightshade	7	SV(SR)
	Circaea lutetiana L. var. *canadensis* L. (*C. quadrisulcata* (Maxim.) Franch. & Sav.)	Enchanter's Nightshade	7,9-15,17	SV(SR)
	Epilobium ciliatum Raf. (*E. glandulosum* Lehm. var. *adenocaulon* (Haussk.) Fern.; includes typical *E. glandulosum* Lehm.)	Sticky Willowherb	2,3,4,6,7	SV(SR)
+	*Epilobium parviflorum* Schreb.	Small-flowered Willowherb	7	SV(SR)
	Epilobium leptophyllum Raf.	Narrow-leaved Willowherb	2,4	SV(SR)
	Oenothera parviflora L.	Small-flowered Evening-primrose	16	SV(SR)
	ARALIACEAE	**GINSENG FAMILY**		
	Aralia nudicaulis L.	Wild Sarsaparilla	7,9-15,17	SV(SR)
	Aralia racemosa L.	Spikenard	9	SV(SR)
PeL	*Panax quinquefolius* L.	American Ginseng	9	SV(TRT95)
	APIACEAE	**CARROT FAMILY**		
	Cicuta bulbifera L.	Bulbous Water-hemlock	2,3,4	SV(SR)
+	*Daucus carota* L.	Queen Anne's Lace	8,11,16	SV(SR)
	Hydrocotyle americana L.	Marsh Pennywort	7	SV(SR),MH(TRT52)
	Osmorhiza claytonii (Michx.) Clarke	Sweet Cicely	9	SV(SR)
L	*Osmorhiza longistylis* (Torr.) DC.	Long-styled Sweet Cicely	9	MH(TRT50)
	Sanicula marilandica L.	Black Snakeroot		MH(TRT50)
	Sium suave Walt.	Water-parsnip	2,3,4,5	SV(SR)
	CORNACEAE	**DOGWOOD FAMILY**		
	Cornus alternifolia L.f.	Alternate-leaved Dogwood	9,10,11,12,15	SV(SR)
	Cornus rugosa Lam.	Round-leaved Dogwood	10,11,14	SV(SR)
	Cornus stolonifera Michx.	Red-osier Dogwood	2,3,4,5,6,7,16	SV(SR)

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	PYROLACEAE	**WINTERGREEN FAMILY**		
	Monotropa uniflora L.	Indian-pipe	10,11	SV(SR)
	Pyrola asarifolia Michx.	Pink Pyrola	11	SV(TRT84)
	Pyrola elliptica Nutt.	Shinleaf	10-15,17	SV(TRT84)
	ERICACEAE	**HEATH FAMILY**		
L	*Chamaedaphne calyculata* (L.) Moench	Leather-leaf	4	MH(TRT59)
	Gaultheria procumbens L.	Wintergreen	10,11	SV(SR)
	PRIMULACEAE	**PRIMROSE FAMILY**		
	Lysimachia ciliata L. (*Steironema ciliata* (L.) Raf.)	Fringed Loosestrife		SV(SR)
	Lysimachia thyrsiflora L.	Tufted Loosestrife	2,3,4,5	SV(SR)
	Trientalis borealis Raf.	Star-flower	6,7,10,11,12,14,15,17	SV(SR)
	OLEACEAE	**OLIVE FAMILY**		
	Fraxinus americana L.	White Ash	7-18	SV(SR)
	Fraxinus nigra Marsh.	Black Ash	4,5,7	SV(SR)
	Fraxinus pennsylvanica Marsh. var. *pennsylvanica* var. *subintegerrima* (Vahl) Fern.	Red Ash	4,5	SV(SR)
	APOCYNACEAE	**DOGBANE FAMILY**		
	Apocynum androsaemifolium L.	Spreading Dogbane	8,10,11,14,16,17	SV(SR)
	ASCLEPIADACEAE	**MILKWEED FAMILY**		
L	*Asclepias exaltata* L.	Poke Milkweed	10	SV(SR),MH(TRT52)
	Asclepias syriaca L.	Common Milkweed	8,11,16	SV(SR)
	CONVOLVULACEAE	**MORNING GLORY FAMILY**		
	Calystegia sepium (L.) R.Br. (*Convolvulus sepium* L.)	Hedge Bindweed	16	SV(SR)
L	*Calystegia spithamea* (L.) Pursh (*Convolvulus spithameus* L.)	Low Bindweed	8,11,16	SV(SR)

Status	Species	Common Name	Community Types	Sources
+	*Convolvulus arvensis* L.	Field Bindweed	16	SV(SR)
	HYDROPHYLLACEAE	**WATERLEAF FAMILY**		
	Hydrophyllum virginianum L.	Virginia Waterleaf	9,12	SV(SR)
	BORAGINACEAE	**BORAGE FAMILY**		
+	*Echium vulgare* L.	Viper's-bugloss	16,18	SV(SR)
	Hackelia virginiana (L.) Johnston	Virginia Stickseed		SV(SR),MH(TRT50)
+	*Myosotis laxa* Lehm.	Smaller Forget-me-not	7	SV(SR)
	LAMIACEAE	**MINT FAMILY**		
+	*Galeopsis tetrahit* L.	Hemp-nettle	11	SV(SR)
+	*Leonurus cardiaca* L.	Motherwort	8,11,16	SV(SR)
	Lycopus americanus Muhl.	American Water-horehound	2,3,4,5,7	SV(SR)
	Lycopus uniflorus Michx.	Water-horehound	2,3,4,5,7	SV(SR)
	Mentha arvensis L. var. *glabrata* (Benth.) Fern. (*M. arvensis* L. ssp. *borealis* (Michx.) R.L. Taylor & Macbryde)	Common Mint	3,4	SV(SR)
+	*Mentha* X*piperita* (*pro sp*.)	Peppermint		SV(SR)
	Monarda fistulosa L.	Wild Bergamot	8,16	SV(SR)
+	*Nepeta cataria* L.	Catnip	11,16	SV(SR)
	Prunella vulgaris L.	Heal-all	7,11,16	SV(SR)
	Satureja vulgaris (L.) Fritsch var. *neogaea* Fern. (*Clinopodium vulgare* L.)	Dogmint	11,16	SV(SR)
	Scutellaria galericulata L. (*S. epilobiifolia* A. Ham.)	Common Skullcap	2,3,4	SV(SR)
	Scutellaria lateriflora L.	Mad-dog Skullcap	2,3,4,7	SV(SR)
	SOLANACEAE	**NIGHTSHADE FAMILY**		
+	*Solanum dulcamara* L.	Climbing Nightshade	2,3,4,5,7	SV(SR)
	SCROPHULARIACEAE	**FIGWORT FAMILY**		
+	*Linaria vulgaris* Mill.	Butter-and-eggs	8,11,16	SV(SR)

Status	Species	Common Name	Community Types	Sources
+	*Verbascum thapsus* L.	Common Mullein	8,11,16	SV(SR)
	Veronica americana (Raf.) Schwein.	American Brooklime	3	SV(SR)
+	*Veronica officinalis* L.	Common Speedwell	10,13	SV(SR)
	OROBANCHACEAE	**BROOM-RAPE FAMILY**		
L	*Conopholis americana* (L.) Wallr.	Squawroot	9	SV(TRT95)
	Epifagus virginiana (L.) Bart.	Beech-drops	9,10,12	SV(TRT84)
	LENTIBULARIACEAE	**BLADDERWORT FAMILY**		
L	*Utricularia vulgaris* L.	Common Bladderwort	1,4,5	SV(SR)
	PHRYMACEAE	**LOPSEED FAMILY**		
	Phryma leptostachya L.	Lopseed	9,10,11,12,14,17	SV(SR)
	PLANTAGINACEAE	**PLANTAIN FAMILY**		
	Plantago rugelii Dcne.	Rugel's Plantain	8,11,16	SV(SR)
	RUBIACEAE	**MADDER FAMILY**		
	Galium aparine L.	Cleavers	9,10,11,12	SV(SR)
	Galium lanceolatum Torr.	Lance-leaved Wild Licorice	9,10	SV(SR)
	Galium palustre L.	Marsh Bedstraw	2,3,4	SV(SR)
	Galium trifidum L. var. *trifidum*	Three-cleft Bedstraw	2,3,4	SV(TRT95)
	Galium triflorum Michx.	Sweet-scented Bedstraw	7-15,17	SV(SR)
+	*Galium verum* L.	Yellow Bedstraw	8,16	SV(TRT95)
	Mitchella repens L.	Partridge-berry	9-15,17	SV(TRT84)
	CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**		
	Diervilla lonicera Mill.	Bush-honeysuckle	8,10,11,13,14,16,17	SV(SR)
	Lonicera canadensis Marsh.	Fly Honeysuckle	9,10,11,12,13,15	SV(TRT84)
	Lonicera dioica L.	Glaucous Honeysuckle	9,10,11,12,13	SV(SR)
+	*Lonicera Xbella* Zabel (*L. tatarica* X *L. morrowi)*	Bell's Honeysuckle	11,16	SV(SR)

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	Sambucus canadensis L.	Common Elder	3,4,5,6	SV(SR)
	Sambucus pubens Michx. (*S. racemosa* L. ssp. *pubens* (Michx.) House)	Red-berried Elder	9-15,17	SV(SR)
	Symphoricarpos albus (L.) Blake var. *albus*	Snowberry	10	SV(SR)
	Viburnum acerifolium L.	Maple-leaved Viburnum	9-15,17	SV(SR)
L	*Viburnum alnifolium* Marsh.	Hobblebush	12	SV(SR),MH(TRT52)
+	*Viburnum lantana* L.	Wayfaring Tree	11,14	SV(SR)
	Viburnum lentago L.	Nannyberry	4	SV(SR)
+	*Viburnum opulus* L.	Guelder-rose	11	SV(SR)
	Viburnum trilobum Marsh (*Viburnum opulus* L. var. *americanum* Ait.)	Highbush-cranberry	7	SV(SR)
	CUCURBITACEAE	**GOURD FAMILY**		
	Echinocystis lobata (Michx.) T. & G.	Wild Cucumber	5,11	SV(SR)
	LOBELIACEAE	**LOBELIA FAMILY**		
	Lobia inflata L.	Indian Tobacco		SV(SR)
	ASTERACEAE	**ASTER FAMILY**		
+	*Achillea millefolium* L.	Common Yarrow	8,11,16	SV(SR)
	Ambrosia artemisiifolia L.	Common Ragweed	16,18	SV(SR)
	Anaphalis margaritacea (L.) Benth.	Pearly Everlasting	3	SV(SR)
	Antennaria neglecta Greene (incl. *A. neodioica* Greene & *A. canadensis* Greene; *A. howellii* E. Greene)	Pussytoes	10	SV(SR)
+	*Arctium minus* (Hill) Bernh.	Common Burdock	8,11,16	SV(SR)
	Aster cordifolius L.	Heart-leaved Aster	8,10,11,14,16	SV(SR)
	Aster ericoides L. (*Virgulus ericoides* (L.) Rev. & Keen)	Heath Aster	16	SV(SR)
	Aster lanceolatus Willd. (*A. simplex* Willd.)	Tall White Aster	3,4,7	SV(SR)
	Aster lateriflorus (L.) Britt.	One-sided Aster	7,9,15	SV(SR)

Status	Species	Common Name	Community Types	Sources
	Aster macrophyllus L.	Large-leaved Aster	9,10,11,13,14,17	SV(SR)
	Aster novae-angliae L. (*Virgulus n.* (L.) Rev. & Keen.)	New England Aster	16	SV(SR)
	Aster puniceus L.	Red-stemmed Aster	2,3,7	SV(SR)
	Bidens cernus L.	Nodding Beggarticks	2,3,4	SV(SR)
	Bidens frondosus L.	Devil's Beggarticks	2,3,4,7	SV(SR)
	Bidens tripartitus L. (incl. *B. comosa* (A. Gray) Wieg.)	Three-parted Beggarticks	2,3,4,7	SV(SR)
+	*Carduus acanthoides* L.	Plumeless Thistle	16	SV(SR)
+	*Chrysanthemum leucanthemum* L. (*Leucanthemum vulgare* Lam.)	Ox-eye Daisy	8,11,16	SV(SR)
+	*Cichorium intybus* L.	Chicory	16	SV(SR)
+	*Cirsium arvense* (L.) Scop.	Canada Thistle	3,16	SV(SR)
+	*Cirsium vulgare* L.	Bull Thistle	16	SV(SR)
	Conyza canadensis (L.) Cronq. (*Erigeron canadensis* L.)	Horse-weed	16,18	SV(SR)
+	*Crepis tectorum* L.	Narrow-leaved Hawk's Beard	18	SV(TRT95)
	Erigeron annuus (L.) Pers. (incl. ssp. *annuus* & ssp. *strigosus* (Muhl. *ex* Willd.) Wagenitz (*Erigeron strigosus* Muhl. *ex* Willd.))	Annual Fleabane	11,16	SV(SR)
	Erigeron philadelphicus L. ssp. *philadelphicus*	Philadelphia Fleabane	11,16	SV(SR)
	Eupatorium maculatum L.	Spotted Joe-Pye-Weed	3,7	SV(SR)
	Eupatorium perfoliatum L.	Boneset	3,7	SV(SR)
	Eupatorium rugosum Houtt.	White Snakeroot	7	SR(SR)
+	*Hieracium aurantiacum* L.	Orange Hawkweed	16	SV(SR)
+	*Hieracium caespitosum* Dum. (*H. pratense* Tausch)	Yellow Hawkweed	8,11,16,17	SV(SR)
	Lactuca biennis (Moench) Fern.	Tall Blue Lettuce	11	SV(TRT95)
+	*Lactuca serriola* L. (*Lactuca scariola* L.)	Prickly Lettuce	16	SV(SR)
	Prenanthes alba L.	White Lettuce	7	SV(SR)

Status	Species	Common Name	Community Types	Sources
	Prenanthes altissima L.	Tall White Lettuce	9,10,11,12,13,14,15	SV(SR)
	Rudbeckia hirta L. (*R. serotina* Nutt.)	Black-eyed Susan	16	SV(SR)
	Solidago altissima L.	Tall Goldenrod	8,11,16	SV(SR)
PrL	*Solidago arguta Aiton*	Sharp-leaved Goldenrod	10	AG(SR)
	Solidago caesia L.	Blue-stem Goldenrod	9-15,17	SV(SR)
	Solidago canadensis L.	Canada Goldenrod	8,11,16	SV(SR)
	Solidago flexicaulis L.	Zig-zag Goldenrod	7,9,12,15	SV(SR)
	Solidago gigantea Ait. (*S. serotina* Ait. var. *gigantea* (Ait.) Gray)	Late Goldenrod	11,16	SV(SR)
	Solidago graminifolia (L.) Salisb. (*Euthamia graminifolia* (L.) Nutt.)	Narrow-leaf Goldenrod	16	SV(SR)
	Solidago nemoralis Ait.	Gray Goldenrod	16	SV(SR)
	Solidago rugosa Ait.	Rough Goldenrod	7	SV(SR)
+	*Sonchus arvensis* L. (incl. ssp. *arvensis* & ssp. *uliginosa* (Bieb.) Nyman *(S. arvensis* L. var. *glabrescens* Guenth., Grab. & Wimm.; *S. uliginosa* Bieb.)	Perennial Sow-thistle	16	SV(SR)
+	*Taraxacum officinale* Weber	Common Dandelion	11,16,17	SV(SR)
+	*Tragopogon dubius* Scop.	Goat's-beard	16	SV(SR)
+	*Tragopogon pratensis* L.	Meadow Goat's-beard	16	SV(SR)
+	*Tussilago farfara* L.	Sweet Coltsfoot	7,16	SV(SR)

APPENDIX B:
BIRDS OF THE MAPLE UPLANDS & KETTLE WETLANDS AREA OF NATURAL AND SCIENTIFIC INTEREST

A total of 51 bird species have been recorded in the Maple Uplands & Kettle Wetlands ANSI. Forty-nine of these species are breeders. All records are based on 1995 field observations with the exception of Blue-winged Warbler record, which is based on a 1981 sighting during the breeding season and noted in MTRCA (1982). Using standard breeding bird atlas criteria (Cadman et al. 1987), breeding status and evidence levels are presented below. The determination of rarity and sensitivity is noted in the legend.

Species	Breeding Status	Breeding Evidence	Rare/Uncommon TRCA Watershed	Sensitivity
Red-tailed Hawk	o	SH		
Wild Turkey	o	SH	L	S
Killdeer	P	T		
Mourning Dove	o	SH		
Black-billed Cuckoo	o	SM		P2
Great Horned Owl	o	SH		
Ruby-throated Hummingbird	o	SH		P3
Belted Kingfisher	x			
Downy Woodpecker	P	SM, T		
Hairy Woodpecker	o	SM		
Northern Flicker	P	T		
Eastern Wood-Pewee	P	T		S
Alder Flycatcher	P	SM, T		P3, F
Eastern Phoebe	P	SM, T		P3, F
Great Crested Flycatcher	o	SM		
Eastern Kingbird	P	T, A		P3
Tree Swallow	o	SH		
Bank Swallow	o	SH		P2
Blue Jay	o	SM, SH		
American Crow	P	SH, T		
Black-capped Chickadee	o	SH		P4
Red-breasted Nuthatch	o	SH		P3, F
House Wren	P	SM, T		
Veery	P	SM, T		S, P3, F
Wood Thrush	o	SM		P4, F
American Robin	P	SM, T		
Gray Catbird	o	SM		P3
Cedar Waxwing	o	SM, SH		
Red-eyed Vireo	P	SM, T		
Blue-winged Warbler	x		L	
Chestnut-sided Warbler	o	SM	L	S, P1, F
Ovenbird	o	SM		S, P4, F
Mourning Warbler	o	SM		P2, F
Common Yellowthroat	o	SM		
American Redstart	o	SM		P2, F
Scarlet Tanager	o	SM		P2, F
Northern Cardinal	o	SM, SH		
Rose-breasted Grosbeak	o	SM		
Indigo Bunting	o	SM		

Eastern Towhee	P	SM, T	S, P3
Chipping Sparrow	o	SM	
Field Sparrow	o	SM	P3
Vesper Sparrow	P	T, A	P3
Savannah Sparrow	P	T	
Song Sparrow	P	SM, T	
Swamp Sparrow	o	SM	P2
Bobolink	P	T	P2
Red-winged Blackbird	o	SM	
Brown-headed Cowbird	o	SH	
Northern Oriole	o	SM, SH	
American Goldfinch	o	SM, SH	P3

Legend:

Significance for Breeding Species

L Locally rare to uncommon in the Toronto and Region Conservation Authority (TRCA) watershed, being known from 20 or less stations (Lionel Normand 1999).

Sensitivity for Breeding Species

P1-4 Conservation priority forest, wetland and open country bird species for York Region ranging from conservation priority level 1 (highest) to level 4 (lowest) based on Bird Studies Canada (Couturier 1999)

S Species of concern in the TRCA watershed (TRCA 1999)

F Forest bird species with the highest sensitivity to forest cover in southern Ontario based on Canadian Wildlife Service (Cadman 1999)

Breeding Status

P Probable

o Possible

x Observed during breeding season, no breeding evidence

Breeding Evidence

Probable:

A Agitated behaviour of adults around nest

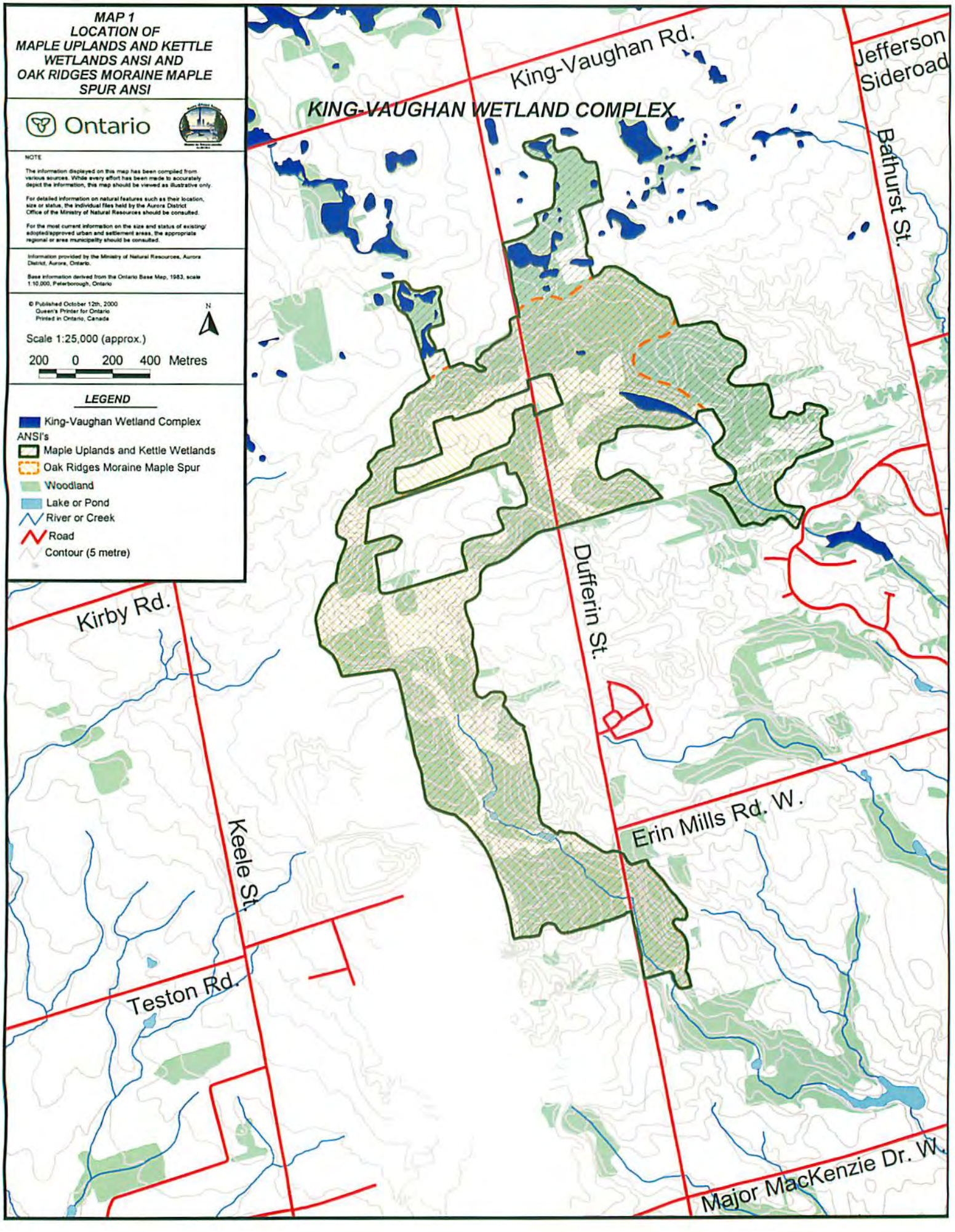
P Adult pair observed

T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days a week or more apart, at the same place

Possible:

SM Singing male observed in suitable nesting habitat

SH Species observed in suitable habitat during breeding season


MAP 1
LOCATION OF
MAPLE UPLANDS AND KETTLE
WETLANDS ANSI AND
OAK RIDGES MORAINE MAPLE
SPUR ANSI
Ontario
NOTE
The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should be viewed as illustrative only.
For detailed information on natural features such as their location, size or status, the individual files held by the Aurora District Office of the Ministry of Natural Resources should be consulted.
For the most current information on the size and status of existing/adopted/approved urban and settlement areas, the appropriate regional or area municipality should be consulted.
Information provided by the Ministry of Natural Resources, Aurora District, Aurora, Ontario.
Base information derived from the Ontario Base Map, 1983, scale 1:10,000, Peterborough, Ontario
© Published October 12th, 2000
Queen's Printer for Ontario
Printed in Ontario, Canada
N
Scale 1:25,000 (approx.)
200 0 200 400 Metres
LEGEND
King-Vaughan Wetland Complex
ANSI's
Maple Uplands and Kettle Wetlands
Oak Ridges Moraine Maple Spur
Woodland
Lake or Pond
River or Creek
Road
Contour (5 metre)
KING-VAUGHAN WETLAND COMPLEX
King-Vaughan Rd.
Jefferson Sideroad
Bathurst St.
Dufferin St.
Kirby Rd.
Keele St.
Teston Rd.
Erin Mills Rd. W.
Major MacKenzie Dr. W.

PROVINCIALLY SIGNIFICANT
EAST DON RIVER HEADWATER WETLAND COMPLEX SUMMARY

December 2019
GEM Services Inc. on behalf of the City of Vaughan

Ontario Base Maps: 10 17 6150 48600; 6200 48550
National Topographic Series Map: 30 M/13, 30M/14
UTM Reference: 17T PU 621200E 48590800N
Latitude: 43° 52' 30" **Longitude**: 79° 29' 30"
Aerial Photographs: 1:1,000 scale, 2013 Ortho-rectified Digital Imagery, J.D. Barnes and Land Information Ontario
Municipality, Lots & Concessions: Regional Municipality of York, City of Vaughan, former Vaughan Township: Concession 3, Lots 25 – 28 & Concession 2, Lots 25 - 22
Conservation Authority: Toronto and Region (TRCA)
Ownership: 100% public
Wetland Status: Provincially Significant
Number of Wetlands & Area: 11 wetlands, 29.30 ha
Wetland Type: swamp 87 %, marsh 13 %
Wetland Substrate: and mesic/humic organic 53%, clay/loam 46%, sand 1%
Wetland Site Type: palustrine with no inflow 92%, isolated: 6 %, riverine 2%
Dominant Vegetation Form: coniferous trees (c): 66% deciduous trees (h): 5%, dead coniferous trees (dc): 6.%, tall shrubs (ts): 9%, herb (ground cover) (gc): 1%, narrow leaved emergents (ne): 3%, robust emergents (re): 6%, submerged plants (su): 1%, fixed-floating plants (f): 1%, free-floating plants (ff): 1%, unvegetated open water (u): 1%
Wetland Score: Biological Component 105, Social Component 117, Hydrological Component 198, Special Features 250, Total 670
Investigators & Dates Investigated: July/August 2017, June/September 2018 & 2019 Joelle Pecora & Kim Logan (GEM Services Inc.), June 14, 2017 & July 18, 2018 Kim Logan (GEM Services Inc.) & Steve Varga, Thivyah Sivasubramianum, Austeja Vaskeviciute, Melanie Shapiera & Lauren Moretto (OMNRF, Aurora District)
Estimated Field Survey Time: Total person hours - 80
Compilers: Joelle Pecora & Kim Logan

Rationale for Identifying the East Don River Headwater Wetland Complex

The provincially significant East Don River Headwater Wetland Complex is a new complex that has been evaluated in 2019 by GEM Services Inc. on behalf of the City of Vaughan. In addition to fieldwork carried out by GEM Services Inc. staff from 2017 to 2019 the evaluation incorporates the Ecological Land Classification (ELC) vegetation descriptions and mapping carried out by Toronto and Region Conservation Authority (TRCA) staff in 2002, 2009 and 2015. On June 14, 2017 and July 18, 2018, wetlands on City of Vaughan owned lands (Wetland Nos. 1, 2, 3 and a northwest portion of Wetland No. 4) had their outer boundaries delineated by a professional surveyor, with staff from GEM Services Inc., OMNRF, Aurora District, the City of Vaughan and TRCA in attendance. These wetland boundaries were agreed to by all parties and have been incorporated into the wetland complex. In addition, the vegetation communities in these surveyed wetlands were described using the Ontario Wetland Evaluation System (OWES) methodology.

This wetland complex occurs on the Oak Ridges Moraine physiographic region, which is a part of ecodistrict 6E-7 (Chapman and Putnam 1984). The complex is situated in the north-eastern portion of the City of Vaughan, north of Major Mackenzie Drive and bounded by Keele Street to the west and Bathurst Street to the east.

The wetland complex is located on the headwaters of the East Don River, a subwatershed of the Don River watershed. Each individual wetland is located from 33 to 504 metres to its nearest neighbouring wetland, with an average distance of 230 metres between wetlands (wetlands are allowed to be up to 750 metres apart in a wetland complex). Most of the wetlands are hydrologically linked by watercourses within the complex.

The wetland complex largely occurs on public lands with the western portion mainly in the future North Maple Regional Park and the eastern portion in the Maple Nature Reserve and associated parkland. The main wetlands occur in the forested valley tributaries of the East Don River with the remaining smaller wetlands on adjacent tablelands

The wetlands are also linked by intervening forests, hedgerows, and regenerating meadows. Dufferin Street bisects the complex, with a large box culvert at the river providing for wildlife movement. Wildlife has been noted moving between wetlands in the complex and to and from the surrounding uplands.

There are connections to wetlands downstream of the wetland complex along the largely forested river valley corridor of the East Don River, which provides a connection south to Lake Ontario. This valley corridor also provides links to the wetlands and woodlands on the Oak Ridges Moraine, a major east-west corridor.

The wetland complex captures the diversity of wetland types along the headwater reaches of the East Don subwatershed. It mainly consists of large palustrine, groundwater-fed wetlands on humic/mesic organics with areas of clays and loams particularly in the smaller surrounding wetlands. This portion of the subwatershed with its groundwater inputs is currently managed as coldwater (TRCA 2009). The dominant wetland vegetation forms are conifer dominated swamps with scattered narrow-leaved emergent marshes, robust emergent marshes, tall shrub swamps, deciduous swamps, herb marshes and various open water marshes. The wetlands support a diversity of 26 vegetation communities with ten significant species.

Reasons for the Inclusion of Wetland Units Under Two Hectares in Size

There are nine wetlands within the East Don River West Branch Headwater Wetland Complex that are under two hectares in size (Wetland Nos. 1–3, 5-10). Wetlands are considered rare in ecodistrict 6E-7 (OMNR 2014), with an estimate of only 6% wetland coverage. Most of these wetlands, like the nine wetlands in the complex, are under two hectares in size. It is estimated that over 80% of the wetland units on the Moraine are less than two hectares in size, and 60% are under 0.5 hectares. On such landscapes small wetlands provide an important ecological benefit.

Each of the wetlands under two hectares in size were included in the wetland complex for one or more of the following additional reasons:

1) Add to the diversity of a wetland complex that is dominated by conifer swamps by supporting other wetland types and dominant vegetation forms that are uncommon in the wetland complex (Wetland Nos. 6 & 9 support herb marshes, a dominant form which occupies only 1% of the wetland complex, Wetland Nos. 1, 2 & 3 support tall shrub swamps which occur in only 9% of the wetland complex, Wetland No. 8 supports a narrow-leaved emergent marsh a dominant form which occupies only 3% of the complex, Wetland Nos. 2, 4 & 7 support robust emergent marshes found in only 6% of the complex, Wetland No. 10 supports deciduous swamp, a dominant form found in only 5% of the wetland complex).
2) Sustain significant species (Wetland No. 10 is occupied habitat for an endangered fish, the Redside Dace, Wetland Nos. 1 & 2 are a traditional feeding for the provincially threatened Barn Swallow, Wetland Nos. 1 & 5 support the provincially significant Midland Painted Turtle and Wetland No. 7 supports a locally uncommon plant, Star Duckweed (*Lemna triscula*)).
3) Support amphibian breeding (Wetland Nos. 1-3, 5-7).
4) Support native fish (Wetland No. 10).
5) Provide intervening wetland habitat between larger wetlands (Wetland No. 10 occurs between the larger upstream Wetland Nos. 4 & 11 and larger wetlands downstream of the wetland complex.
6) Are hydrologically connected to other wetlands (Wetland Nos. 6-9 outflow into Wetland No. 4 situated on the East Don River and Wetland 10 occurs on the East Don River which flows downstream through other wetlands).

In addition, the nine wetlands that are less than two hectares in size all occur along corridors, with Wetland Nos. 2, 3, 5-9 within or adjacent to tableland woodlots that are part of the East Don River corridor, a major valley corridor from Lake Ontario to the Oak Ridges Moraine. Wetland No. 1, while it is 1.2 kilometres west of this corridor, is linked to the corridor by intervening regenerating fields. Wetland No. 10 occurs in the East Don River valley corridor.

Rationale for Wetland Vegetation Communities Under 0.5 Hectares in Size

All wetlands in the complex have been mapped at the scale of 1:1,000, providing for a more accurate and detailed delineation of boundaries for the wetlands and their associated wetland communities. Boundary delineations were done using 2013 ortho-rectified aerial imagery.

A total of 20 vegetation community polygons in the wetland complex are under 0.5 hectares in size. Six of these are single vegetation communities in wetlands less than 0.5 hectares in size. The others have been mapped and identified because they represent major divisions in wetland types such as between marsh and swamp types, or between dominant vegetation forms such as tall shrub swamp, ground cover marsh, narrow-leaved emergent, robust emergent marsh, submerged, fixed-floating and free-floating open water marsh, and unvegetated open water. These vegetation divisions reflect differences in plant species and often in animal communities.

Biological Component

The East Don River Headwater Wetland Complex has a score of 105 for its biological component. It consists of 11 wetlands covering a total of 29.3 hectares.

Approximately 53% of the wetland complex is situated on humic/mesic organics with the remaining 46% on clays/loams and 1% on sand.

About 92 % of the wetland complex is palustrine with the largest wetlands (Wetland Nos. 4 & 11) fed by groundwater outflows that support the permanently flowing headwaters of the East Don River. The small tableland wetlands of Wetland Nos. 6-9 outflow in the spring into the large Wetland No. 4. The small Wetland Nos. 1-3 & 5 are isolated with no apparent outflows and occupy another 6% of the complex. The remaining 2% is riverirne (Wetland No. 10).

The East Don wetlands sustain 26 different vegetation communities with approximately 87% of the complex swamp types, and 13% marsh types. These wetlands have a moderate level of complexity or interspersion.

Most frequent are conifer dominated swamps which are confined to the large Wetland No. 4 and cover 66% of the wetland complex. They are dominated by conifer trees of Eastern White Cedar (*Thuja occidentalis*) often with scattered deciduous trees of Yellow Birch (*Betula alleghaniensis*) and understories of Mountain Maple (*Acer spicatum*), Sensitive Fern (Onoclea sensibilis), Spotted Jewelweed (*Impatiens capensis*) and Bulblet Fern (*Cystopteris bulbifera*). These swamps typically occur on organic seepage areas that are fed by groundwater outflows. In one area, covering 6.3% of the complex the cedars have died crating a layer of dead white cedar among the scattered living cedar trees and saplings.

Much less frequent are two deciduous swamp communities of Green Ash (*Fraxinus pennsylvanica*) and Reddish Willow (*Salix xrubens*) covering 6% of the complex.

Occupying 9% of the complex are tall shrub (thicket) swamps of Red-osier Dogwood (*Cornus sericea*), Missouri Willow (*Salix eriocephala*), Interior Willow (*Salix exigua*) and one community of European Alder (*Alnus glutinosa*).

Narrow-leaved emergent (graminoid) marshes and a one graminoid dominated open swamp cover 3% of the wetland complex. The marshes are dominated by Reed Canary Grass (*Phalaris arundinacea*) and Field Horsetail (*Equisetum arvense*). The open swamp community is dominated by Reed Canary Grass, with a scattering of Bebb's Willow (*Salix bebbiana*) shrubs and Manitoba Maple (*Acer negundo*) trees.

Herb or ground cover marshes of Panicled Aster (*Symphyotrichum lanceolatum*) cover 1% of the wetland complex. It is frequently associated with Spotted Joe Pye Weed (*Eutrochium maculatum*) and Coltsfoot (*Tussilago farfara*).

Robust emergent marshes cover 6% of the wetland complex. These communities are dominated by Broad-leaved Cattail (*Typha latifolia*), Narrow-leaved Cattail (*Typha angustifolia*) Hybrid Cattail (*Typha* x*glauca*) and, in two communities, the invasive European Common Reed (*Phragmites australis* ssp. *australis*).

Open water marsh communities make up the remaining 4% of the wetland complex. A submerged community has Sago Pondweed (*Stuckenia pectinata*), while a free-floating community has Turion Duckweed (*Lemna turionifera*) and there is a fixed-floating community of White Water-lily (*Nymphaea odorata*). Finally, there is a small unvegetated open water pond.

The East Don also supports a diversity of adjacent upland habitats including deciduous, mixed and conifer forests on tableland woodlots and valley slopes, in addition to regenerating meadows and hedgerows.

The wetlands and adjacent uplands at the East Don support a diversity of 483 vascular plant species (GEMS 2017-2019, GEMS & OMNRF 2017-2018, TRCA 2002-2015, Varga et al. 2000). There are ten reptile and amphibian species including Eastern Red-backed Salamander, American Toad, Tetraploid Grey Treefrog, Spring Peeper, Wood Frog, Northern Leopard Frog, Green Frog, Common Snapping Turtle, Midland Painted Turtle and Eastern Gartersnake and 58 breeding bird species in the wetlands and surrounding uplands (GEMS 2017-2019, GEMS & OMNRF 2017-2018, TRCA 2001-2015, Varga et al. 2000). The watercourses in and around the

wetlands support seventeen fish species (OMNR 1972–2003).

Adjacent uplands are important for many wetland species at the East Don and are critical for the maintenance of its wetland functions. The populations of American Toad, Tetraploid Gray Treefrog, Spring Peeper and Wood Frog rely on the wetlands for breeding, but forage and hibernate in upland forests and, in some cases, meadows. Green Frogs can forage near their wetlands, and Northern Leopard Frogs forage in fields a considerable distance from their wetlands. They also move between wetlands, hibernating in the bottom of deeper permanent ponds, and breeding in more shallow wetlands. Green Frogs Midland Painted Turtles and Common Snapping Turtles are largely found in the more permanent wetland ponds. The turtles will move from wetland to wetland during the year, and female turtles lay their eggs in uplands in proximity to a wetland.

Social Component
The East Don River Headwater Wetland Complex has a score of 117 for its social component.

The wetlands in the complex are largely in public ownership. The westernmost Wetland Nos. 1 to 3 and the northwest portion of Wetland No. 4 occur on public lands that will become part of the future North Maple Regional Park. East of Dufferin Street, Wetland Nos. 4 to 9 are part of the Maple Nature Reserve and associated parkland. Its trails and lookouts in and around the wetlands get high use for nature enjoyment by visitors from the surrounding residential community. Other uses, such as timber harvesting, trapping, and hunting, are not permitted and there is no fishing.

Non-research reports have been carried out on the state of the Don River watershed (MTRCA 1994, TRCA 2009) and on the Maple Uplands & Kettle Wetlands Life Science and Maple Spur Earth Science Areas of Natural and Scientific Interest (ANSI) that cover the western portion of the wetland complex (Varga et al. 2000).

The East Don wetlands are generally in good condition. Dufferin Street divides up the wetland complex, however there is a major box culvert at the river that continues to provide a wildlife connection.

Seven ponds once occurred in Wetland No.4 that have either been dug-out of the wetland and/or have water control structures. These are small ponds, a fraction of a hectare in size, except for the 2.75 ha former mill pond of Redlemeier Pond. To minimize the impacts of these ponds to coldwater fish habitat agencies are proposing the removal of dams and the restoration of watercourses and wetlands in the former ponds. In 2017, TRCA had to carry out emergency de-watering of the Redelmeier Pond, make repairs to a failed water control structure and remove toppled trees from the slumping earthen dam (TRCA 2018). Since then there have been public open houses to discuss various future options for the pond. The option chosen recommends removing the earthen dam and water control structure and restoring the watercourse and marsh on the former bed of the pond (Cliff Coppolino pers. comm. 2019). In 2019, TRCA has removed the control structures on two small ponds just upstream of the Redelmeier Pond. These former pond beds are now coming into cattail marsh (Cliff Coppolino pers. comm. 2019).

Wetland Nos. 1 to 3 have developed on lands that where once used as a source of capping material for a landfill site to the south. Wetland No. 5 was created to make up for the loss of a nearby wetland. These four wetlands now support a diversity of wetland vegetation communities and amphibian breeding, with Wetland No. 1 also having a population of Midland Painted Turtles.

Invasive plants occur in some of the wetlands including Purple Loosestrife (*Lythrum salicaria*), True Forget-me-not (*Myosotis scorpioides*), European Common Reed (*Phragmites australis* ssp. *australis*), Common Buckthorn (*Rhamnus cathartica*) and European Buckthorn.

Hydrological Component
The East Don River Headwater Wetland Complex has a high score of 198 for its hydrological component. The wetlands contribute flood attenuation, short term water quality improvement, long term nutrient trapping, and groundwater recharge and discharge.

The wetlands constitute 81% of all the water detention or storage areas in the East Don River upstream catchment area, which covers 654 hectares.

The complexes' largest wetlands are a major headwater source for the East Don River. The numerous seeps in Wetland Nos. 4 & 11 appear to be originating from the upper aquifers of the Oak

Ridges Moraine and are responsible for providing permanent year-round flows to the East Don River.

Special Features
The East Don River Headwater Wetland Complex has the maximum score of 250 for its special features.

The East Don wetlands occur on the Oak Ridges Moraine physiographic region, within ecodistrict 6E-7. The OMNRF has subdivided the province into 71 ecodistricts, which are characterised by similar physiography and climate. Ecodistrict 6E-7 is on the southern edge of the deciduous-coniferous forest ecoregion 6E. This ecodistrict encompasses two physiographic regions: Oak Ridges Moraine (the largest moraine in southern Ontario) and the glacial tills of the South Slope that gradually rise to meet the Moraine. This wetland complex is situated on a southerly spur of the Oak Ridges Moraine known as the Maple Spur (Varga et al. 2000).

Wetlands are considered rare in ecodistrict 6E-7 (OMNRF 2014) with wetlands covering about 6% of the surface area. On the Oak Ridges Moraine there are numerous small kettle wetlands and, on its margins, larger groundwater discharge wetlands that provide base flows to watercourses draining to the south into Lake Ontario and to the north into Lake Simcoe and the Kawartha Lakes. The smaller kettle wetlands also play a critical role in the overall health of the Moraine's ecosystem.

The East Don wetlands are noted for their significant species, with ten in total (see Table 1). These include occupied habitat for an endangered fish, the Redside Dace, a traditional feeding area for the threatened Barn Swallow, breeding areas for the provincially significant Eastern Wood-pewee, Wood Thrush and Midland Painted Turtle and five locally significant plant species.

The Province has designated the East Don River in Wetland No. 4 as recovery habitat and, the river in Wetland No. 10 as occupied habitat for the endangered Redside Dace. The threatened Barn Swallow has been observed feeding over Wetland Nos. 1 and 2 and the surrounding meadows in 2017, 2018 and 2019. The special concern Eastern Wood-pewee and Wood Thrush both occur in the conifer dominated swamps and surrounding upland forests of Wetland No. 4 and the Midland Painted Turtle was found in ponds at Wetland Nos. 1 & 4 and in Wetland No. 5. The locally rare plants occur in a variety of communities in Wetland No. 4.

Table 1. Significant species

Reproductive Habitat for an Endangered or Threatened Species
Status: Based on Regulation 230/08 under the *Endangered Species Act*: E- provincially endangered species based on Species at Risk in Ontario List
Source: provincial mapping of Redside Dace occupied habitat on the East Don River
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Clinostomus elongatus* (Redside Dace) E; W10

Traditional Migration or Feeding Habitat for an Endangered or Threatened Species
Status: Based on Regulation 230/08 under the *Endangered Species Act*: T- provincially threatened species based on Species at Risk in Ontario List
Source: G- observed feeding over the wetlands and surrounding meadows by Joelle Pecora & Kim Logan GEM Services Inc. in 2017, 2018 and 2019)
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Hirundo rustica* (Barn Swallow) T; G W1, 2

Provincially Significant Animal Species
Status: SC- provincial species of special concern, N- species tracked by the OMNRF Natural Heritage Information Centre (NHIC)
Source: T- observations in 2001 & 2002 Paul Prior (TRCA), Z- observations in 2015 by Gavin Miller, Dell Tune & Sue Hayes (TRCA), G- Kim Logan & Joelle Pecora (GEM Services Inc.), M- July 4, 2018 observations by Kim Logan (GEM Services Inc.) & Steve Varga, Melanie Shapiera & Lauren Moretto (OMNRF, Aurora District)
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Chrysemsys picata marginata* (Midland Painted Turtle) N; G W1, 4; Z W5
2. *Contopus virens* (Eastern Wood-pewee) N, SC; T, Z, M W4
3. *Hylocichla mustelina* (Wood Thrush) N, SC; G, T W4

Locally Significant Plant Species (Rare in Ecodistrict 6E-7)
Status: Rare in Ecodistrict 6E-7, being known from 20 or less locations (Varga et al. 2004)
Source: T- Natalie Iwanicki and Gavin Miller Toronto and Region Conservation Authority (2002, 2009, 2015), G- GEM Services Inc.
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Carex alopecoidea* (Foxtail Wood Sedge) T W4
2. *Carex aquatilis* (Water Sedge) T W4
3. *Nymphaea odorata* (White Water-lily) G W4
4. *Solidago patula* (Rough-leaved Goldenrod) T W4
5. *Stellaria longifolia* (Long-leaved Stitchwort) T W4

Locally Uncommon Plant Species (Uncommon in Ecodistrict 6E7)*
Status: Uncommon in Ecodistrict 6E-7, being known from 21 to 40 or less locations (Varga et al. 2004)

Source: T- Natalie Iwanicki and Gavin Miller Toronto and Region Conservation Authority (2002, 2009, 2015), G- GEM Services Inc., V- June 14, 2017 Kim Logan (GEM Services Inc.) & Steve Varga, Thivyah Sivasubramianum & Austeja Vaskeviciute (OMNRF, Aurora District)
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11

1. *Aralia racemosa* (Spikenard) T W4
2. *Carex laevivaginata* (Smooth-sheathed Sedge) T W4, 11
2. *Carex scabrata* (Rough Sedge) T W4, 11
3. *Chrysosplenium americanum* (Golden Saxifrage) T W4
4. *Dryopteris clintoniana* (Clinton's Wood Fern) T W4
4. *Equisetum scirpoides* (Dwarf Horsetail) T W4
5. *Equisetum sylvaticum* (Woodland Horsetail) T W4
6. *Lemna trisulca* (Star Duckweed) T W7, 11
7. *Pilea fontana* (Spring Clearweed) T W11
8. *Spirodela polyrhiza* (Greater Duckweed) T W11
9. *Stuckenia pectinata* (Sago Pondweed) V W2; T W4
10. *Veronica americana* (American Speedwell) T W4

*Locally uncommon plant species provided are not assigned points in the wetland scoring record but are provided as one of the reasons for the inclusion of wetland units less than two hectares in size.

The East Don wetlands are important for wildlife. Its swamps and associated upland forests support area-sensitive forest bird species (Couturier 1999, Cadman 1999, OMNR 2000) such as Eastern Wood-pewee, Ovenbird, Wood Thrush, Veery, Scarlet Tanager, American Redstart, Pileated Woodpecker, Hairy Woodpecker, Red-breasted Nuthatch, Pine Warbler, Black-throated Green Warbler and Brown Creeper (TRCA 2001-2015, GEMS 2017-2019, OMNRF & GEMS 2017-2018).

Furthermore, the wetland ponds provide a stopover for migrating waterfowl and support breeding Wood Duck, as well as the more common Mallard and Canada Goose (TRCA 2001-2015). Other wetland birds breeding in the East Don wetlands include: Belted Kingfisher, Swamp Sparrow, Spotted Sandpiper, and the more frequent Yellow Warbler, Common Yellowthroat and Red-winged Blackbird.

The East Don wetlands also support breeding populations of amphibians at Wetland Nos. 1-7 & 11. Three of the amphibians, including Wood Frog, Spring Peeper, and Tetraploid Gray Treefrog, are considered sensitive species because they are becoming uncommon in the TRCA watershed and are exhibiting declines in abundance. These declines are probably attributable to the loss of wetland habitat, adjacent upland forest and meadow habitat, and a loss of connecting corridors. These frogs require spring-flooded wetlands for breeding and forested habitats for feeding and hibernating, and they need to be able to travel between these habitats. Other more common species breeding in the wetlands include American Toad, Green Frog, and Northern Leopard Frog.

The East Don River supports locally significant coldwater fish spawning and nursery habitat and migration habitat. Species in and around the wetlands include: Brown Trout, Brook Trout, Rainbow Trout, Pumpkinseed, White Sucker, Largemouth Bass, Yellow Perch, Eastern Blacknose Dace, Northern Redbelly Dace, Longnose Dace, Creek Chub, Spottail Shiner, Common Shiner, Fathead Minnow, Bluntnose Minnow, Mottled Sculpin and Brook Stickleback (OMNR 1972–2003). There was once a warmwater fisheries with Smallmouth Bass in Redelmeier Pond but they were removed to another pond outside the wetland complex when it had to be de-watered because of an imminent dam failure in 2017. The East Don River in the wetland complex is considered recovery habitat for the endangered Redside Dace and downstream of the Redelmeier dam it is Redside Dace occupied habitat. With the anticipated removal of the Redelmeier dam and the 2019 removal of several small upstream dams it is anticipated that Redside Dace may begin to use this recovery habitat.

Conclusion

The East Don River Headwater Wetland Complex is provincially significant with a total score of 670 points and a score of 250 points for special features. A wetland that scores 600 or more points or has 200 or more points in either the biological or special features component is deemed to be provincially significant.

The East Don's 11 wetlands comprise a wetland complex, noted for its groundwater-fed and kettle wetlands and its significant species.

Recommendations

Major wetland functions to be maintained at the East Don River Headwater Wetland Complex include: its diversity of wetlands, its diversity of species, its groundwater seeps, its association of wetlands and uplands, and its wildlife corridors.

To ensure that wetland functions are maintained, it is important to maintain water quality, quantity, and seasonal duration to the wetlands. Alterations to water regimes could have impacts on wetland communities and their resident species.

To maintain species and community diversity, the interconnected network of wetlands and uplands should be maintained and strengthened to the extent possible. Adjacent uplands for East Don species include the surrounding forests, as well as hedgerows and regenerating meadows.

The resident populations of Wood Frog, Tetraploid Gray Treefrog, and Spring Peeper are dependent on upland forests for hibernating and foraging, and they can travel a considerable distance to get to resident forests. As a result, it is also critical that travel corridors be maintained between their forest habitats and their breeding ponds. The presence of forest bird species also necessitates maintaining swamps and associated forests. Many of these forest birds can experience declines following urban development (Friesen et al. 1995).

Adjacent regenerating upland meadows and hedgerows could be utilized by wetland species such as nesting waterfowl, which can nest several hundred metres from a wetland. The resident Green Frogs, Northern Leopard Frogs, and American Toads will forage in them.

Wildlife corridors in the East Don wetlands need to be maintained and strengthened. Studies have shown the importance of wildlife corridors in maintaining diversity and resiliency in an ecosystem (Riley and Mohr 1994, OMNR 2000a, 2001). In addition to the travel corridors between breeding ponds and upland habitats, there are also wildlife corridors along the forested East Don River valley and its tributaries.

The Don River is a major north-south corridor from Lake Ontario to the Oak Ridges Moraine, which is the longest east-west corridor in southern Ontario (OMNR 2000b, 2001).

Encouragement should be given to increasing forest cover in and around the East Don wetlands. Restoration should be focused around the wetlands, the tableland woodlots, connecting hedgerows, and along the tributary streams.

Invasive species also need to be controlled; particularly European Common Reed, which is starting to spread in several wetlands and may have important biological impacts. This tall grass is largely restricted to a portion of Wetland No. 3 and along wetland edge on the eastern side of Dufferin Street.

Support the continued efforts to improve coldwater fish habitat in the wetland complex by removing dams and restoring watercourses and wetlands to the former beds of their ponds. Particularly encourage the future restoration efforts on the former bed of the Redelmeier Pond. Once the pond bed has been restored to wetland consideration should be given to adding it to the East Don River Headwater Wetland Complex.

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East Don River Headwater Wetland Complex

Wetland Evaluation 2014, 3rd Edition, Version 3.3

December 2019

Comments

Attached documents include:

1) Provincially Significant Wetland Complex summary
2) Rationale for identifying this wetland complex, reasons for the inclusion of wetland units under 2 ha in size, and rationale for wetland vegetation communities under 0.5 ha in size
3) List of vegetation communities in the Wetland Complex
4) Map of interspersion for the Wetland Complex
5) Map of catchment area and detention area for Wetland Complex
6) List of significant species in the Wetland Complex
7) Fish records in and around the Wetland Complex
8) List of vascular plant species in the Wetland Complex & adjacent lands
9) List of mammal, herpetofauna, and bird species in the Wetland Complex & adjacent lands
10) Map of the Wetland Complex

Additional Information

Include relevant information that can not be entered in the wetland data record (Ex. Sections that have not been completed.)

Official Name:	East Don River Headwater Wetland Complex					
Evaluation Edition:	3rd 2014	Class:	\	\		
Wetland Significance:	Month/Year Last Evaluated			December 2019		
	Month/Year Last Updated					
Special Planning Considerations:				**Scores**		
Wetland Area:	29.30 ha			Biological:	105	
Other Detention Areas:	7.00 ha			Social:	117	
Catchment Area:	654.30 ha			Hydrological:	198	
Coastal Unit Area:	0.00 ha			Special Features:	250	
OMNRF Source:				Overall:	670	
Information Source:	GEM Services Inc.; TRCA ELC mapping, species occurrences					
Submitted by:	GEM Services Inc. on behalf of the City of Vaughan			Date	December 2019	

General Information

Wetland Evaluator(s)

Name:	Kim Logan	Affiliation:	GEMS
Name:	Joelle Pecora	Affiliation:	GEMS
Name:	Steve Varga, Thivyah Sivasubramianum	Affiliation:	MNRF
Name:	Austeja Vaskeviciute, Melanie Shapiera,	Affiliation:	MNRF
Name:	& Lauren Moretto	Affiliation:	MNRF

Date(s) wetland visited (in field): Multiple days in summer of 2017, 2018 and 2019

Date evaluation completed: December 2019

Estimated time devoted to completing the field survey in person hours: 80 hours

Weather Conditions

i) at time of field work: sunny, warm, clear

ii) summer conditions in general: very warm, moderately rainy

WETLAND EVALUATION DATA AND SCORING RECORD

i) Wetland Name: East Don River Headwater Wetland Complex

ii) MNR Administrative Region: Southern
MNR District: Aurora
MNR Area Office:

iii) Conservation Authority Jurisdiction: Toronto and Region Conservation Authority

iv) County of Regional Municipality: Regional Municipality of York

v) Township/Geographic Twp and/or Local Municipality: City of Vaughan

vi) Lots & Concessions: former Vaughan Township: Concession 3, Lots 25 - 28 & Concession 2, Lots 22 - 25

vii) Ecodistrict/Ecoregion: 6E-7

viii) Map and Air Photo References:

a) Latitude: 43 52' 30" Longitude: 79 29' 30"

b) UTM grid reference:

Zone: 17T Block: PU E: 621200 N: 48590800

c) National Topographic Series:

Map name(s): Bolton & Markham

Map number(s): 30M13 & 30M14

Edition:
Scale: 1:50,000

d) Aerial photographs:

Date(s) photo taken: 2013, 2018 Scale: 1:1,000
Flight & plate numbers: Spring 2013 Ortho-rectified Digital Imagery, J.D. Barnes and Land Information Ontario, 2018 Google Earth

e) Ontario Base Map numbers & scale: 10 17 6150 48600; 10 17 6200 48550 scale 1:10,000

ix) Wetland Size
(circle appropriate category, a or b)

a) Single contiguous wetland area:

Total wetland size = **29.30** ha

b) Wetland complex comprised of **11** individual wetlands:

Wetland Unit No.	1	0.70
Wetland Unit No.	2	1.24
Wetland Unit No.	3	0.10
Wetland Unit No.	4	21.99
Wetland Unit No.	5	0.13
Wetland Unit No.	6	0.03
Wetland Unit No.	7	0.08
Wetland Unit No.	8	0.21
Wetland Unit No.	9	0.04
Wetland Unit No.	10	0.51
Wetland Unit No.	11	4.26
Wetland Unit No.		
Wetland Unit Totals:		29.30

Total Wetland Size = **29.30** ha

Documentation requirements for evaluated wetland complexes:

: a statement of rationale for identifying a wetland complex;
: a statement of rationale for identifying any wetland complex less than 2 ha in total size;
: a statement of rationale for any vegetation community less than 0.5 ha in size;
: adherence to the wetland complexing rules (750 m; “watershed rule”; lacustrine wetlands); and
: written documentation of the reasons for including wetland units smaller than 2 ha.

See Attached Sheets 3A

East Don River Headwater Wetland Complex

Rationale for Identifying the East Don River Headwater Wetland Complex

The provincially significant East Don River Headwater Wetland Complex is a new complex that has been evaluated in 2019 by GEM Services Inc. on behalf of the City of Vaughan. In addition to fieldwork carried out by GEM Services Inc. staff from 2017 to 2019 the evaluation incorporates the Ecological Land Classification (ELC) vegetation descriptions and mapping carried out by Toronto and Region Conservation Authority (TRCA) staff in 2002, 2009 and 2015. On June 14, 2017 and July 18, 2018, wetlands on City of Vaughan owned lands (Wetland Nos. 1, 2, 3 and a northwest portion of Wetland No. 4) had their outer boundaries delineated by a professional surveyor, with staff from GEM Services Inc., OMNRF, Aurora District, the City of Vaughan and TRCA in attendance. These wetland boundaries were agreed to by all parties and have been incorporated into the wetland complex. In addition, the vegetation communities in these surveyed wetlands were described using the Ontario Wetland Evaluation System (OWES) methodology.

This wetland complex occurs on the Oak Ridges Moraine physiographic region, which is a part of ecodistrict 6E-7 (Chapman and Putnam 1984). The complex is situated in the north-eastern portion of the City of Vaughan, north of Major Mackenzie Drive and bounded by Keele Street to the west and Bathurst Street to the east.

The wetland complex is located on the headwaters of the East Don River, a subwatershed of the Don River watershed. Each individual wetland is located from 33 to 504 metres to its nearest neighbouring wetland, with an average distance of 230 metres between wetlands (wetlands are allowed to be up to 750 metres apart in a wetland complex). Most of the wetlands are hydrologically linked by watercourses within the complex.

The wetland complex occurs largely on public lands with the western portion mainly in the future North Maple Regional Park and the eastern portion in the Maple Nature Reserve and associated parkland. The main wetlands occur in the forested valley tributaries of the East Don River with the remaining smaller wetlands on adjacent tablelands

The wetlands are also linked by intervening forests, hedgerows, and regenerating meadows. Dufferin Street bisects the complex, with a large box culvert at the river providing for wildlife movement. Wildlife has been noted moving between wetlands in the complex and to and from the surrounding uplands.

There are connections to wetlands downstream of the wetland complex along the largely forested river valley corridor of the East Don River, which provides a connection south to Lake Ontario. This valley corridor also provides links to the wetlands and woodlands on the Oak Ridges Moraine, a major east-west corridor.

The wetland complex captures the diversity of wetland types along the headwater reaches of the East Don subwatershed. It mainly consists of large palustrine, groundwater-fed wetlands on humic/mesic organics with areas of clays and loams particularly in the smaller surrounding wetlands. This portion of the subwatershed with its groundwater inputs is currently managed as coldwater (TRCA 2009). The dominant wetland vegetation forms are conifer dominated swamps with scattered narrow-leaved emergent marshes, robust emergent marshes, tall shrub swamps, deciduous swamps, herb marshes and various open water marshes. The wetlands support a diversity of 26 vegetation communities with ten significant species.

Reasons for the Inclusion of Wetland Units Under Two Hectares in Size

There are nine wetlands within the East Don River West Branch Headwater Wetland Complex that are under two hectares in size (Wetland Nos. 1–3, 5-10). Wetlands are considered rare in ecodistrict 6E-7 (OMNR 2014), with an estimate of only 6% wetland coverage. Most of these wetlands, like the nine wetlands in the complex, are under two hectares in size. It is estimated that over 80% of the wetland units on the Moraine are

less than two hectares in size, and 60% are under 0.5 hectares. On such landscapes small wetlands provide an important ecological benefit.

Each of the wetlands under two hectares in size were included in the wetland complex for one or more of the following additional reasons:

1) Add to the diversity of a wetland complex that is dominated by conifer swamps by supporting other wetland types and dominant vegetation forms that are uncommon in the wetland complex (Wetland Nos. 6 & 9 support herb marshes, a dominant form which occupies only 1% of the wetland complex, Wetland Nos. 1, 2 & 3 support tall shrub swamps which occur in only 9% of the wetland complex, Wetland No. 8 supports a narrow-leaved emergent marsh a dominant form which occupies only 3% of the complex, Wetland Nos. 2, 4 & 7 support robust emergent marshes found in only 6% of the complex, Wetland No. 10 supports deciduous swamp, a dominant form found in only 5% of the wetland complex).
2) Sustain significant species (Wetland No. 10 is occupied habitat for an endangered fish, the Redside Dace, Wetland Nos. 1 & 2 are a traditional feeding for the provincially threatened Barn Swallow, Wetland Nos. 1 & 5 support the provincially significant Midland Painted Turtle and Wetland No. 7 supports a locally uncommon plant, Star Duckweed (*Lemna triscula*)).
3) Support amphibian breeding (Wetland Nos. 1-3, 5-7).
4) Support native fish (Wetland No. 10).
5) Provide intervening wetland habitat between larger wetlands (Wetland No. 10 occurs between the larger upstream Wetland Nos. 4 & 11 and larger wetlands downstream of the wetland complex.
6) Are hydrologically connected to other wetlands (Wetland Nos. 6-9 outflow into Wetland No. 4 situated on the East Don River and Wetland 10 occurs on the East Don River which flows downstream through other wetlands).

In addition, the nine wetlands that are less than two hectares in size all occur along corridors, with Wetland Nos. 2, 3, 5-9 within or adjacent to tableland woodlots that are part of the East Don River corridor, a major valley corridor from Lake Ontario to the Oak Ridges Moraine. Wetland No. 1, while it is 1.2 kilometres west of this corridor, is linked to the corridor by intervening regenerating fields. Wetland No. 10 occurs in the East Don River valley corridor.

Rationale for Wetland Vegetation Communities Under 0.5 hectares in Size

All wetlands in the complex have been mapped at the scale of 1:1,000, providing for a more accurate and detailed delineation of boundaries for the wetlands and their associated wetland communities. Boundary delineations were done using 2013 ortho-rectified aerial imagery.

A total of 20 vegetation community polygons in the wetland complex are under 0.5 hectares in size. Six of these are single vegetation communities in wetlands less than 0.5 hectares in size. The others have been mapped and identified because they represent major divisions in wetland types such as between marsh and swamp types, or between dominant vegetation forms such as tall shrub swamp, ground cover marsh, narrow-leaved emergent, robust emergent marsh, submerged, fixed-floating and free-floating open water marsh, and unvegetated open water. These vegetation divisions reflect differences in plant species and often in animal communities.

1.0 BIOLOGICAL COMPONENT

1.1 Productivity

1.1.1 Growing Degree-Days/Soils

Refer to page 43 of manual for further explanation.

1. Determine the correct GDD value for your wetland (use Figure 5).
2. Circle the appropriate GDD value from the evaluation table below.
3. Determine the Fractional Area (FA) of the wetland for each soil type.
4. Multiply the fractional area of each soil type by the applicable score-factor in the evaluation table.
5. Sum the scores for each soil type to obtain the final score (maximum score is 30 points).

Note: In wetland complexes the evaluator should aim at determining the fractional area occupied by the categories for the complex as a whole.

Growing Degree- Days	Clay- Loam	Silt-Marl	Lime- stone	Sand	Humic-Mesic	Fibric	Granite
<2800	15	13	11	9	8	7	5
2800-3200	18	15	13	11	9	8	7
3200-3600	**22**	18	15	**13**	**11**	9	7
3600-4000	26	21	18	15	13	10	8
>4000	30	25	20	18	15	12	8

Soil Type	FA of wetland in soil type		Enter appropriate score-factor from above table			
clay/loam:	0.47	X	22	=	10.3	(10.15 ha)
silt/marl:	0.00	X	0	=	0.0	(0.00 ha)
limestone:	0.00	X	0	=	0.0	(0.00 ha)
sand:	0.01	X	13	=	0.1	(3.60 ha)
humic/mesic:	0.53	X	11	=	5.8	(15.55 ha)
fibric:	0.00	X	0	=	0.0	(0.00 ha)
granite:	0.00	X	0	=	0.0	(0.00 ha)
Total					16.3	

GDD/ Soils Score 16
(maximum 30 points)

1.1.2 Wetland Type

(Fractional Area = area of wetland type/ total wetland area)

	Fractional Area			Score		
Bog	0.00	X	3 =	**0.0**	(0.00	ha)
Fen	0.00	X	6 =	**0.0**	(0.00	ha)
Swamp	0.87	X	8 =	**7.0**	(25.37	ha)
Marsh	0.13	X	15 =	**2.0**	(3.93	ha)
Total			=	**8.9**		

Wetland Type Score **9**
(maximum 15 points)

1.1.3 Site Type

(Fractional Area = area of site type/ total wetland area)

	Fractional Area			Score		
Isolated	0.06	X	1 =	**0.06**	(1.72	ha)
Palustrine (permanent or intermittent flow)	0.92	X	2 =	**1.84**	(27.07	ha)
Riverine	0.02	X	4 =	**0.08**	(0.51	ha)
Riverine (at rivermouth)	0.00	X	5 =	**0.00**	(0.00	ha)
Lacustrine (at rivermouth)	0.00	X	5 =	**0.00**	(0.00	ha)
Lacustrine (on enclosed bay,with barrier beach)	0.00	X	3 =	**0.00**	(0.00	ha)
Lacustrine (exposed to lake)	0.00	X	2 =	**0.00**	(0.00	ha)
			Subtotal:	**1.98**		

Site Type Score **2**
(maximum 5 points)

1.2 Biodiversity

1.2.1 Number of Wetland Types

(Check only one)

	one	=	9 points
x	two	=	13
	three	=	20
	four	=	30

Number of Wetland Types Score 13
(maximum 30 points)

1.2.2. Vegetation Communities

Use the data sheet provided in Appendix 4 to record and score vegetation communities (the completed form must be attached to this data record)

Scoring (circle only one option for each of the columns below):

Total # of communities with 1-3 forms	
1 =	1.5 points
2 =	2.5
3 =	3.5
4 =	4.5
5 =	5
6 =	5.5
7 =	6
8 =	6.5
9 =	7
10 =	7.5
11 =	8
+ 0.5 for each additional community	
=	11.0
Total of 17 Communities	

Total # of communities with 4-5 forms	
1 =	2 points
2 =	3.5
3 =	5
4 =	6.5
5 =	**7.5**
6 =	8.5
7 =	9.5
8 =	10.5
9 =	11.5
10 =	12.5
11 =	13
+ 0.5 for each additional community	
=	7.5
Total of 5 Communities	

Total # of communities with 6 or more forms	
1 =	3 points
2 =	5
3 =	7
4 =	**9**
5 =	10.5
6 =	12
7 =	13.5
8 =	15
9 =	16.5
10 =	18
11 =	19
+ 0.5 for each additional community	
=	9.0
Total of 4 Communities	

See vegetation community sheet 6A

Subtotal: 27.5

Vegetation Communities Score 27
(maximum 45 points)

1.2.2. Vegetation Communities - East Don River Headwater Wetland Complex

Wetland Unit #	Field #, Date & Source	Map Code	Vegetation Forms	Dominant Species[1], Secondary Species[2],Tertiary Species3 (% cover by form) (size in hectares; site type: I- isolated, P- palustrine with no inflow, Pi- palustrine with inflow; soil type; g- depth to mottling & G- depth to gley in centimeters (cm) when present; wt- depth to water table in cm, O- depth of organics in cm if present; ow- estimated percent permanent open water; presence of seepage; wildlife records, significant species & comments: PT- provincially threatened, PS- provincially significant species, LR- locally significant (locally rare) and LU- locally uncommon plant species in ecodistrict 6E7 (Varga et al., 2004), M- June 14, 2017 observations of Steve Varga, Thivyah Sivasubramianum & Austeja Vaskeviciute (OMNRF Aurora District) & Kim Logan (GEM Services Inc.), S- GEM Services Inc. staff observations in 2017, 2018 & 2019, V- July 18, 2018 observations of Steve Varga, Melanie Shapiera & Lauren Moretto (OMNRF, Aurora District), Timothy Law (Ontario Streams) & Kim Logan (GEM Services Inc.); G- 2018 observations of Kim Logan & Joelle Pecora (GEM Services Inc.); P- Paul Prior (TRCA) observations 2001, I- Natalie Iwanicki (TRCA) observations 2001, T- Gavin Miller (TRCA) observations 2009 & 2015, Z- Sue Hayes & Dell Tune (TRCA) observations 2015)
1	2017-1 MNRF, GEMS	tsS1-A	ts*,gc,ne	ts: Salix exigua[1], Salix eriocephala[1], Cornus sericea2 (50); gc: Galium asprellum[1], Symphyotrichum lanceolatum[2], Lythrum salicaria[2], Utrica dioica[2] (70); re: Typha angustifolia[1], Phragmites australis ssp. australis1 (25) (0.7; I; clay: A Horizon- silty clay with organics 15 cm & Horizon B- gravel 15 cm then silty clay; g-10; G-0; 0-2; ow-10; wildlife: S- Midland Painted Turtles with 2 adults & 28 juveniles (1-2 years old), Green Frog call level 1 (4 individuals), Gray Treefrog call level 2 (10-20 individuals), 3 Mallards calling in pond, M- several calling Green Frogs, one female and two male Mallards, Eastern Kingbird, Common Yellowthroat, Red-winged Blackbird & Northern Oriole calling on territory during the breeding season, Tree Swallow feeding over wetland and pond, amphipods (scuds), pond snails, beetles, red mites, mayfly nymphs, damselfly nymphs, water striders, midges, true bugs; Significant species: S- Midland Painted Turtle (PS), Barn Swallow feeding over several years (PT); comments: this community rings the edge of a 1.67 hectare open water pond over 2 metres deep)
2	2017-2 MNRF, GEMS	tsS1-A	ts*,gc,ne	ts: Salix exigua[1], Salix eriocephala[1] (60) ; gc: Symphyotrichum lanceolatum[1], Lotus corniculatus[1], Symphyotrichum novae-angliae2, Lythrum salicaria2 (25) ; ne: Equisetum arvense[1], Equisetum hyemale[2], Poa palustris[2] (60) (0.31; I; clay: clay 30 cm+; g-0; G-30; ow-0)

2	2017-3 MNRF, GEMS	reM1-A	re*	re: Typha latifolia[1], Typha angustofolia[1], Phragmites australis ssp. australis[1] (70); (0.68; I; clay: clay 30+ cm; g-0; G-30; ow-0; wildlife: M- Red-winged Blackbirds, pond snails, fingernail clams, beetles)
2	2017-4 MNRF, GEMS	suW2	su*	su: Stuckenia pectinata[1] (70); (0.25; I; clay: clay 30+ cm; g-0; G-30; ow-90; wildlife: M- damselfly, damselfly nymph, fingernail clams, American Toad tadpoles, dragonfly, beetle larvae, S- full chorus (call level 3) of Spring Peepers and Gray Treefrogs, 1 Green Frog calling, 1 Wood Frog calling, 2 ducks, American Woodcock; significant species: M- Stuckenia pectinata (LU))
3	2018-5 MNRF, GEMS	tsS1-B	ts*,gc,ne	ts: Salix exigua (70); gc: Lythrum salicaria[1], Symphyotrichum laceolatum[2] (25); ne: Phalaris arundinacea (40) (0.1; I; clay: A Horizon- sandy clay 40+ cm; g-10; G-25; wt-0; ow-0)
4	2018-6 MNRF, GEMS	hS2	h*,ts,gc,ne	h: Fraxinus pennsylvanica[1], Salix xrubens[2], Acer rubrum[2], Betula alleghaniensis[2], Ulmus americana[2] (80); ts: Rhamnus cathartica[1], Cornus sericea[1], Acer spicatum[1] (50); gc: Impatiens capensis[1], Onoclea sensibilis[2], Matteuccia struthiopteris[2] (30) (0.94; P; clay: A Horizon- sandy clay 40+ cm; g-10; G-25; ow-0; seepage; wildlife: Wood Frog, water striders in stream; significant species: V- Carex scabrata (LU))
4	2018-7 MNRF, GEMS	tsS3	h,ts*,gc,ne	h: Salix xrubens[1], Populus balsamifera[1], Populus tremuloides[2] (25); ts: Cornus sericea (60); gc: Onoclea sensibilis[1], Impatiens capensis[1], Eutrochium maculatum[2], Lythrum salicaria[2] (70); ne: Equisetum arvense (25) (0.38; P; sand: A Horizon- sandy clay 20 cm & B Horizon- sand 20+ cm; g-30; G-30; wt-5; ow-0; seepage; wildlife: V- Common Yellowthroat calling on territory during breeding season)
4	2018-3 GEMS	fW3	re,f*	re: Typha angustifolia; f: Nymphaea odorata (0.2; P; clay: A Horizon- clay 40+ cm; G-0; wt-0; ow-100, seepage; wildlife: V- Green Frog calling, dragonfly nymph/exigua, backswimmers, fingernail clams, pond snails, minnows; S- Midland Painted Turtle, Garter Snake, Great Blue Heron feeding, dragonflies; significant species: G- Nymphaea odorata (LS), Midland Painted Turtle (PS))
4	2018-9, 11 MNRF, GEMS	cS4	h,c*,ts,gc	h: Betula alleghaniensis (25); c: Thuja occidentalis[1], Tsuga canadensis[1] (45); ts: Acer spicatum (30); gc: Onoclea sensibilis[1], Impatiens capensis[2] (70) (3.22; P; sand: A Horizon- sandy clay 20 cm & B Horizon- sand 20+ cm; g-30; G-30; wt-5; ow-0; seepage; significant species: V- Eastern Wood-pewee (PS) calling on territory during breeding season)
4	2018-10 MNRF, GEMS	uW4	u*	u: unvegetated open water (0.12; P; clay: A Horizon- clay 40+ cm; G-0; wt-0; ow-100; seepage; wildlife: V- Green Frog calling, backswimmers, pond snails, dragonfly nymph, Creek Chub)
4	2001-58729 TRCA, 2018-5 GEMS	neM5	gc,re,ne*	gc: Impatiens capensis1, Lythrum salicaria2, Lycopus uniflorus2; re: Typha angustifolia; ne: Phalaris arundinacea1, Equisetum arvense1, Carex stipata2 (0.61; P; clay; ow-0; wildlife: G- Gray Catbird)
4	2018-5 GEMS	fW6	f*	f: Nymphaea odorata (0.37; P; clay; ow-100; significant species: G- Nymphaea odorata (LS))

4	2001-58882 TRCA, 2018-2 GEMS	cS5	c*,ts,ls,gc,m,ne	c: Thuja occidentalis; ts: Thuja occidentalis; ls: Thuja occidentalis; gc: Onoclea sensibilis, Impatiens capensis; m: mosses; ne: Equisetum arvense (2.15; P; clay: A Horizon- silty clay loam; B- Horizon sandy clay, g-10, G-25; O-15; seepage; ow-0; Wildlife: K- Common Yellowthroat; Significant species: T- Carex aquatilis (LS), Wood Thrush (PS))
4	2018-1 GEMS	tsS6	h,dh,ts*,ls,gc,ne	h: Betula sp.; dh: Fraxinus sp. (10); ts: Salix sp.; ls: Salix sp.; gc: Impatiens capensis; ne: grasses (0.66; P; mesic organic; O-45, g-5, G-5, wt-40; ow-0; seepage; wildlife: G- White Admiral)
4	2018-6 GEMS	dcS7	h,dc*,ts,ls,gc,re	h: Salix sp., Populus sp., Betula sp.; ch: dead Thuja occidentalis (70); ts: Salix sp.; ls: Salix sp.; gc: Impatiens capensis, Onoclea sensibilis; re: Typha sp. (1.85; P; clay; ow-0; seepage; wildlife: G- Monarch)
4	2009-69536 TRCA	reM7	gc,re*	re: Phramites australis ssp. australis1, Typha angustifolia2; gc: Impatiens capensis1, Tussilago farfara1 (0.43; P; clay; ow-0)
4	2009-695555	cS8	h,c*,ts,gc,m,ne	h: Tilia americana1, Betula alleghaniensis2; c: Thuja occidentalis1, Tsuga canadensis2; ts: Thuja occidentalis1, Acer spicatum2, Cornus sericea2; gc: Cystopteris bulbifera1, Tussilago farfara2; ne: Equisetum arvense (1.38; P; mesic organic; O-40+; ow-0; seepage; Significant species: T- Carex alopecoidea (LS), Stellaria longifolia (LS), Carex laevivaginata (LU), Carex scabrata (LU), Dryopteris clintoniana (LU), Equisetum sylvaticum (LU), Z- Eastern Wood-Pewee(PS))
4	2009-69500 TRCA	neM8	gc,ne*	gc: Solidago altissima, Mentha spicata, Myosotis scorpioides; ne: Equisetum arvense (0.08; P; loam: sandy loam; 0-15; seepage; ow-0; Significant species: T- Stellaria longifolia (LS), Carex laevivaginata (LU), Carex scabrata (LU))
4	2009-69515, 2015-43294 TRCA	cS8	h,c*,ts,gc,m,ne	h: Betula alleghaniensis1, Ulmus americana2, Populus blasmifera2; c: Thuja occidentalis1, Tsuga canadensis2; ts: Thuja occidentalis1, Ulmus americana2, Tilia americana2; gc: Impatiens capensis1, Cystopteris bulbifera1, Laportea canadensis2; m: mosses; ne: Equisetum arvense1, Carex scabrata2 (8.91; P; humic organic; O-40+; ow-0; seepage; Significant species: T- Carx alopecoidea (LS), Solidago patula (LS), Aralia racemosa (LU), Carex laevivaginata (LU), Carex scabrata (LU), Chrysosplenium americanum (LU), Dyopteris clintoniana (LU), Equisetum scirpoides (LUI), Pilea fontana (LU), Veronica americana (LU), Z- Eastern Wood-Pewee (PS))
4	2015-43268 TRCA	reM9	gc,re*,ne	gc: Impatiens capensis, Epilobium hirstum2, Lythrum salicaria3, Bidens cernua3, Pilea pumila3; re: Typha latifolia; ne: Phalaris arundinacea1, Leersia oryzoides2 (0.43; P; humic organic, O-40+; ow-0: Significant species: T- Hydrocotyle americana (LU))
4	2015-43251 TRCA	tsS1-C	ts*,gc,ne	ts: Alnus glutinosa; gc: Symphyotrichum lanceolatum1, Solidago altissima1, Bidens cernua1, Impatiens capensis2; ne: Phalaris arundinacea (0.08; P; clay; ow-0)

4	TRCA	reM1	re*	re: Typha sp. (0.08; P; clay; ow-0; Comment: former open water pond with submerged plants, its control structure has been removed in 2019 and the drained pond is now developing into a cattail marsh, wetland shrubs have been planted along the former pond edge)
4	MNRF	reM1	re*	re: Typha sp. (0.08; P; clay; ow-0; Comment: community based on air-photo interpretation)
5	2015-43278 TRCA	reM12	m,re*,ff	m: mosses; re: Typha xglauca; ff: Lemna turionifera (0.13; I; clay; ow-10; wildlife: Z- Spring Peeper (call level 1), Wood Frog (call level 1), Green Frog (call level 2), Swamp Sparrow; Significant Species: Z- Midland Painted Turtle (PS))
6	2009-69558 TRCA	gcM13	gc*	gc: various herbaceous species (0.23; P; loam; ow-0; Wildlfie: T: Wood Frog)
7	2009-69519 TRCA	reM14	re*,ff	re: Typha latifolia; ff: Lemna trisulca1, Riccia fluitans2 (0.08; P; loam; ow-40; Significant species: T- Lemna trisulca (LU); Wildlife: T- Green Frog (call level 1), Z- Spring Peeper (call level 3), Wood Frog (call level 1))
8	2015-43249	neS12	h,ts,ne*	h: Acer negundo1, Populus balsamifera2 (30); ts: Salix bebbiana1, Salix discolor2, Cornus sericea3 (30); ne: Phalaris arundinacea (60+) (0.21; P; loam; ow-0); Wildlife: Z - Eastern Kingbird, Grey Catbird)
9	2015-43254 TRCA	gcM11	gc*,ne	gc: Symphyotrichum lanceolatum1, Eutrochium maculatum2; ne: Phalaris arundinacea (0.04; P; loam; ow-0)
10	2015-43275 TRCA	hS9	h*,dh,gc,ne	h: Salix xrubens; dh: dead Fraxinus sp.; gc: Impatiens capensis1, Eutrochium maculatum2, Symphyotrichum puniceum2, Pilea pumila3; ne: Equisetum arvense (0.51; R; humic organic; O-40+; ow-0)
11	2015-43240 TRCA	cS10	h,c*,gc,ne	h: Betula alleghaniensis1, Populus sp.1; c: Thuja occidentalis1, Tsuga canadensis2; gc: ferns1, Impatiens capensis2, Eutrochium maculatum2; ne: Equisetum arvense (3.68; P; humic organic; O-40+; seepage; ow-0: Significant species: Carex laevivaginata (LU), Carex scabrata (LU), T- Pilea fontana (LU), Z- Grey Catbird, Eastern Wood-Pewee (PS))
11	2015-43227 TRCA	reM1-B	re*	re: Typha xglauca (0.04; P; humic organic; O-40+; ow-0); Wildlife: Z- Green Frog calling
11	2015-43227 TRCA	ffW10	ff*	ff: Lemna turionifera1, Spirodela polyrhiza2, Riccia fluitans (60+) (0.03; P; clay; ow-100: Wildlife: Z- Hooded Merganser; Significant species: T- Spirodela polyrhiza (LU))
11	2015-43244 TRCA	tsS11	ts*	ts: Cornus sericea1, Salix discolor2, Salix bebbiana3 (0.3; P; clay; ow-0)
11	2015-43248 TRCA	neM5	gc,re,ne*	gc: Eutrochium maculatum1, Symphyotrichum lanceolatum2; re: Typha latifolia; ne: Phalaris arundinacea (0.09; P; clay; ow-0)
11	2015-43235 TRCA	gcM11	gc*,ne	gc: Symphyotrichum lanceolatum1, Tussilago farfara1, Solidago altissima2, Euthamia graminifolia3; ne: Equisetum arvense (0.12; P; clay; ow-0) Wildlife: Z - Grey Catbird

Legend

Vegetation Forms:

h- deciduous trees
c- coniferous trees
dh- dead deciduous trees
dc- dead coniferous trees
ts- tall shrubs
ls- low shrubs
gc- herb (ground cover)
m- mosses
re- robust emergents
ne- narrow-leaved emergents
f- free floating plants
ff- fixed-floating plants
su- submerged plants
u- unvegetated
*- dominant form

Map Codes:

W- open water marsh
M- marsh
S- swamp

Wetland Name: East Don River Headwater Wetland Complex

Wetland Size (ha): 29.3

Vegetation Form	% area in which form is dominant	
h	**4.92**	(1.44 ha)
c	**66.04**	(19.35 ha)
dh	0.00	(0.00 ha)
dc	**6.31**	(1.85 ha)
ts	**8.60**	(2.52 ha)
ls	0.00	(0.00 ha)
ds	0.00	(0.00 ha)
gc	**1.09**	(0.32 ha)
m	0.00	(0.00 ha)
ne	**3.38**	(0.99 ha)
be	0.00	(0.00 ha)
re	**6.25**	(1.83 ha)
ff	**0.89**	(0.26 ha)
f	**1.26**	(0.37 ha)
su	**0.85**	(0.25 ha)
u (unvegetated)	**0.41**	(0.12 ha)
Total = 100%	100.00	

1.2.3 Diversity of Surrounding Habitat

Check all appropriate items. Only habitat within 1.5 km of the wetland boundary and at least 0.5 ha in size is to be scored.

1	row crop
	pasture
1	abandoned agricultural land
1	deciduous forest
1	coniferous forest
1	mixed forest*
	abandoned pits and quarries
	open lake or deep river
	fence rows with cover, or shelterbelts
1	terrain appreciably undulating, hilly, or with ravines
1	creek flood plain
7	Subtotal

** "Mixed forest" is defined as either 25% coniferous trees distributed singly or in clumps in deciduous forest, or 25% deciduous treesdistributed singly or in clumps in coniferous forest. Note that Forest Resource Inventory (FRI) maps can be misleading since 25% conifer within a unit could be entirely concentrated around a lake.*

Score 1 point for each feature checked, up to a maximum of 7 points.

Diversity of Surrounding Habitat Score (maximum 7 points) **7**

1.2.4 Proximity to Other Wetlands

Check highest appropriate category. (Note: if the wetland is lacustrine, score option #1 at 8 points).

	Hydrologically connected by surface water to other wetlands (different dominant wetland type) or to open lake or deep river within 1.5 km	8 points
	Hydrologically connected by surface water to other wetlands (same dominant wetland type) within 0.5 km	8
	Hydrologically connected by surface water to other wetlands (different dominant wetland type), or to open lake or deep river from 1.5 to 4 km away	5
	Hydrologically connected by surface water to other wetlands (same dominant wetland type) from 0.5 to 1.5 km away	5
	Within 0.75 km of other wetlands (different dominant wetland type) or open water body, but not hydrologically connected by surface water	5
2	Within 1 km of other wetlands, but not hydrologically connected by surface water	2
	No wetland within 1 km	0

Name and distance (from wetland) of wetlands/water bodies scored above:

within 1 km of other wetlands, but on a different tributary of the East Don River

Proximity to other Wetlands Score (maximum 8 points) **2**

1.2.5 Interspersion

Number of Intersections = **70**

	Number of Intersections *(Check only one)*		
	26 or less	=	3 points
	27 to 40	=	6
	41 to 60	=	9
12	61 to 80	=	12
	81 to l00	=	15
	101 to 125	=	18
	126 to 150	=	21
	151 to 175	=	24
	176 to 200	=	27
	>200	=	30

Interspersion Score (maximum 30 points) **12**

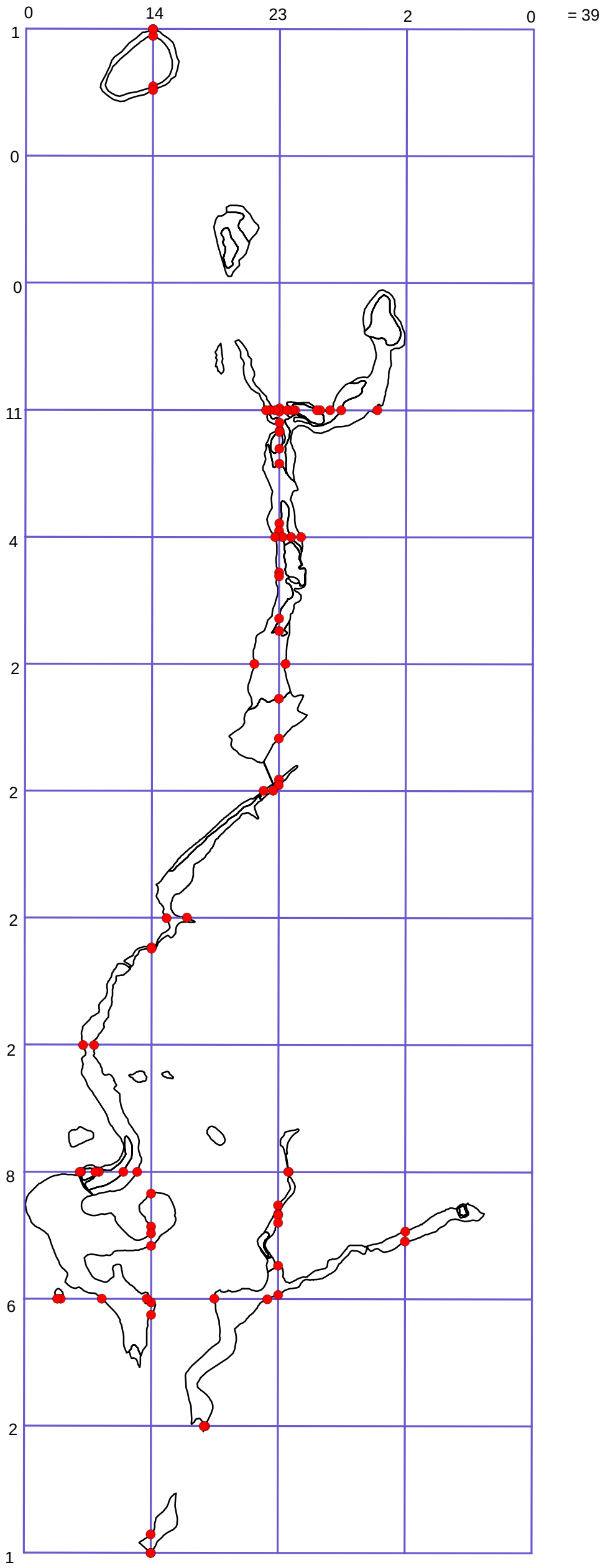
1.2.6 Open Water Types

Note: this attribute is only to be scored for permanently flooded open water within the wetland (adjacent lakes do not count). Check one option only.

	Open Water Type	Characteristic	Points
8	type 1	Open water occupies < 5 % of wetland area	8
	type 2	Open water occupies 5-25% of wetland (occurring in central area)	8
	type 3	Open water occupies 5-25% (occurring in various-sized ponds, dense patches of vegetation or vegetation in diffuse stands)	14
	type 4	Open water occupies 26-75% of wetland (occurring in a central area)	20
	type 5	Open water occupies 26-75% of wetlands (small ponds and embayments are common)	30
	type 6	Open water occupies 76%-95% of wetland (occurring in large central area; vegetation is peripheral)	8
	type 7	Open water occupies 76-95% of wetland (vegetation in patches or diffuse open stands)	14
	type 8	Open water occupies more than 95% of wetland area	3
	no open water		0

Open water occupies **3.41 % (1.00 ha) of wetland complex.** **Open Water Type Score** (maximum 30 points) **8**

EAST DON RIVER HEADWATER WETLAND COMPLEX
INTERSPERSION GRID = 80



Legend

- Intersections (80)
- Grid
- East Don River Headwater Wetland Complex

1:12,000

0 145 290 580 870 1,160 Meters

1.3 Size (Biological Component)

Total Size of Wetland = 29.30 ha

Sum of scores from Biodiversity Subcomponent

1.2.1
+1.2.2
+1.2.3
+1.2.4
+1.2.5
+1.2.6

69

Wetland Size (ha)	Total Score for Biodiversity Subcomponent									
	<37	37-48	49-60	**61-72**	73-84	85-96	97- 108	109-120	121- 132	>132
<20 ha	1	5	7	8	9	17	25	34	43	50
20-40	5	7	8	**9**	10	19	28	37	46	50
41-60	6	8	9	10	11	21	31	40	49	50
61-80	7	9	10	11	13	23	34	43	50	50
81-100	8	10	11	13	15	25	37	46	50	50
101-120	9	11	13	15	18	28	40	49	50	50
121-140	10	13	15	17	21	31	43	50	50	50
141-160	11	15	17	19	23	34	46	50	50	50
161-180	13	17	19	21	25	37	49	50	50	50
181-200	15	19	21	23	28	40	50	50	50	50
201-400	17	21	23	25	31	43	50	50	50	50
401-600	19	23	25	28	34	46	50	50	50	50
601-800	21	25	28	31	37	49	50	50	50	50
801-1000	23	28	31	34	40	50	50	50	50	50
1001-1200	25	31	34	37	43	50	50	50	50	50
1201-1400	28	34	37	40	46	50	50	50	50	50
1401-1600	31	37	40	43	49	50	50	50	50	50
1601-1800	34	40	43	46	50	50	50	50	50	50
1801-2000	37	43	47	49	50	50	50	50	50	50
>2000	40	46	50	50	50	50	50	50	50	50

Size Score (Biological Component) 9
(maximum 50 points)

2.0 SOCIAL COMPONENT

2.1 Economically Valuable Products

2.1.1 Wood Products

Check the option that best reflects the total area (ha) of forested wetland (i.e., areas where the dominant vegetation form is h or c). Note that this is the area of all the forested vegetation communities, not total wetland size.

Do not include areas where harvest is not permitted. Check only one option.

Area of wetland used for scoring 2.1.1:

h:	1.44	c:	19.35

	<5 ha	=	0
	5 -25 ha	=	3
	26 -50 ha	=	6
	51- 100 ha	=	9
	101-200 ha	=	12
	>200 ha	=	18

Source of information:

commercial harvesting not permitted, scores 0

Wood Products Score (maximum 18 points) **0**

2.1.2 Wild Rice

(Check only one)

	Present (minimum size 0.5 ha)	=	6 points
0	Absent	=	0
	Harvest not permitted	=	0

Source of information:

not present based on TRCA, GEMS fieldwork

Wild Rice Score (maximum 6 points) **0**

2.1.3 Commercial Bait Fish

(Check only one)

	Present	=	12 points
	Absent	=	0
0	Fishing not permitted	=	0

Source of information:

commerical bait fish trapping not permitted

Commercial Fish Score 0
(maximum 12 points)

2.1.4 Furbearers

Only species recognized as furbearers under the Fish & Wildlife Conservation Act may be scored here. Score 3 points for each furbearer species listed, up to a maximum of 12 points.

		Name of furbearer	Source of information
1		Commerical trapping not	
2		permitted	
3			
4			
5			
6			
	0	Subtotal	

Furbearer Score 0
(maximum 12 points)

2.2 Recreational Activities

Sources of information and reasons for scoring a wetland under high or moderate use below, must be included below.

Circle one score for each of the activities listed. Score is cumulative – add score for hunting, nature enjoyment and fishing together for final score.

Intensity of Use	Type of Wetland-Associated Use						
		Hunting		Nature Enjoyment/ Ecosystem Study		Fishing	
	High	40 points		40 points	40	40 points	
	Moderate	20		20		20	
	Low	8		8		8	
	Not possible/ Not Known	0		0		0	
	Subtotals		0		40		0
						Total	40

Sources of information (include evidence/criteria forming basis for score and any relevant reference used to obtain that information):
- e.g., Hunting scored at 20 points: 5 hunting blinds observed; hunters using area frequently monitored for compliance (source: D. Black, MNR Conservation Officer)

Hunting: not permitted

Nature: trails present in and around the eastern portion of the wetland complex used by general public for nature enjoyment (high use)

based on TRCA staff observations

Fishing: no longer observed in the field by GEM Sevices Inc. or TRCA staff

Redelmeier Pond once had low fishing use, but pond has been de-watered in 2018

0

Recreational Activities Score 40
(maximum 80 points)

2.3 Landscape Aesthetics

2.3.1 Distinctness

(Check only one)

	Clearly distinct	=	3 points
0	Indistinct	=	0

Landscape Distinctness Score 0
(maximum 3 points)

2.3.2 Absence of Human Disturbance

(Check only one)

	Human disturbances absent or nearly so	=	7 points
4	One or several localized disturbances	=	4
	Moderate disturbance; localized water pollution	=	2
	Wetland intact but impairment of ecosystem quality intense in some areas	=	1
	Extreme ecological degradation, or water pollution severe and widespread	=	0

Details regarding type, extent and location of disturbance scored:

Dufferin Street divides the wetland complex. Residential development around the eastern portion of the wetland complex,. Some introduced plants such as European Comon Reed present along Duffrein Street

Source of information:

GEMS observations

Absence of Human Disturbance Score 4
(maximum 7 points)

2.4 Education and Public Awareness

2.4.1 Educational Uses

Check highest appropriate category.

	Frequent	=	20 points
	Infrequent	=	12
0	No visits	=	0

Details regarding the type and frequency of education uses scored above:

no visitors observed, cannot easily enter the site yet

Source of information:

0

field investigations

Educational Uses Score 0
(maximum 20 points)

2.4.2 Facilities and Programs

Check all appropriate options, score highest category checked.

	Staffed interpretation centre	=	8 points
4	No interpretation centre or staff but a system of self-guiding trails or brochures available	=	4
	Facilities such as maintained paths (e.g., woodchips) boardwalks, boat launches or observation towers but no brochures or other interpretation	=	2
	No facilities or programs	=	0

Additional Notes/Comments:

Maintained paths in and around the eastern portion of the wetland complex.
Trail guides/ brochures available online

Source of information:

GEMS observations, TRCA staff observations

Facilities and Programs Score 4
(maximum 8 points)

2.4.3 Research and Studies

Check all that apply; score highest category checked.

	Long term research has been done	=	2 points
	Research papers published in refereed scientific journal or as a thesis	=	10
5	One or more (non-research) reports have been written on some aspect of the wetland's flora, fauna,hydrology etc.	=	5
	No research or reports	=	0
5	Subtotal:		

List of reports, publications, research studies etc. scored above:

See "Additional Reports"

Research and Studies Score 5
(maximum 12 points)

2.5 Proximity to Areas of Human Settlement

Name of Settlement: Vaughan (Maple)

Distance of wetland from settlement: within settlement

Population of settlement: 306,233 (2016) (Source: StatCan census data)

Circle only the highest score applicable

Distance of wetland to settlement	population >10,000		population 2,500-10,000		population <2,500 or cottage community	
Within or adjoining settlement	40 points	40	26 points		16 points	
0.5 to 10 km from settlement	26		16		10	
10 to 60 km from settlement	12		8		4	
>60 km from settlement	5		2		0	
Total		40		0		0

Proximity to Human Settlement Score 40
(maximum 40 points)

2.4.3 Research and Studies
Additional Reports
Varga, S., J. Fraser & L. Normand. March 1997, updated September 2000. Inventory of Life Science Maple
and Kettle Wetlands and Earth Science Oak Ridges Moraine Maple Spur Areas of Natural and Scientific Interest,
City of Vaughan, Ontario. Ontario Ministry of Natural Resources, Aurora District. 38 pp. + map.
TRCA. 2009. Don River Watershed Plan: Beyond Forty Steps. Toronto, Ontario: Canada. Toronto and
Region Conservation Authority. 211 pp + appendices.
MTRCA. 1994. Forty Steps to a New Don. The Report ofthe Don Watershed Task Force. Downsview, Ontario:
Canada. Metropolitan Toronto and Region Conservation Authority.

2.6 Ownership

FA of wetland held by or held under a legal contract by a conservation body (as defined by the Conservation Land Act) for wetland protection		x	10	=	0.00
FA of wetland occurring in provincially or nationally protected areas (e.g., parks and conservation reserves)		x	10	=	0.00
FA of wetland area in Crown/ public ownership, not as above	1.00	x	8	=	8.00
FA of wetland area in private ownership, not as above		x	4	=	0.00

Source of information:

based on City of Vaughan

Ownership Score 8
(maximum 10 points)

2.7 Size (Social Component)

Total Size of Wetland = 29.30 ha Sum of scores from Subcomponents 2.1, 2.2, and 2.5 = 80

Circle the appropriate score from the table below.

	Total for Size Dependent Score									
	<31	31-45	46-60	61-75	**76-90**	91-105	106-120	121-135	136-150	>150
<2 ha	1	2	4	8	10	12	14	14	14	15
2 - 4ha	1	2	4	8	12	13	14	14	15	16
5 - 8ha	2	2	5	9	13	14	15	15	16	16
9 - 12ha	3	3	6	10	14	15	15	16	17	17
13-17	3	4	7	10	14	15	16	16	17	17
18-28	4	5	8	11	15	16	16	17	17	18
29-37	5	7	10	13	**16**	17	18	18	19	19
38-49	5	7	10	13	16	17	18	18	19	20
50-62	5	8	11	14	17	17	18	19	20	20
63-81	5	8	11	15	17	18	19	20	20	20
82-105	6	9	11	15	18	18	19	20	20	20
106-137	6	9	12	16	18	19	20	20	20	20
138-178	6	9	13	16	18	19	20	20	20	20
179-233	6	9	13	16	18	20	20	20	20	20
234-302	7	9	13	16	18	20	20	20	20	20
303-393	7	9	14	17	18	20	20	20	20	20
394-511	7	10	14	17	18	20	20	20	20	20
512-665	7	10	14	17	18	20	20	20	20	20
666-863	7	10	14	17	19	20	20	20	20	20
864-1123	8	12	15	17	19	20	20	20	20	20
1124-1460	8	12	15	17	19	20	20	20	20	20
1461-1898	8	13	15	18	19	20	20	20	20	20
1899-2467	8	14	16	18	20	20	20	20	20	20
>2467	8	14	16	18	20	20	20	20	20	20

Size Score (Social Component) 16

2.8 Aboriginal Values and Cultural Heritage

Either or both Aboriginal or Cultural Values may be scored. However, the maximum score permitted for 2.8 is 30 points.

Full documentation of sources must be attached to the data record.

2.8.1 Aboriginal Values

	Significant	=	30 points
	Not Significant	=	0
0	Unknown	=	0
0	Total:		

Additional Comments/Notes:

unknown

2.8.2 Cultural Heritage

	Significant	=	30 points
0	Not Significant	=	0
	Unknown	=	0
0	Total:		

Additional Comments/Notes:

not present

Aboriginal Values/ Cultural Heritage Score **0**
(maximum 30 points)

3.0 HYDROLOGICAL COMPONENT

3.1 Flood Attenuation

Check one of the following four options.

	If wetland is a single contiguous coastal wetland, [a] score 0 points for this section.
	If all wetland units of a wetland complex are coastal wetland units, [a] score 0 points for this section.
	If wetland or wetland complex is entirely isolated in site type, [a] score 100 points automatically.
X	Wetland not as above – proceed through 'steps' A through L below.

(A)	Total wetland area	=	29.3	ha			
(B)	Size of wetland's catchment	=	654.30	ha			
(C)	Size of other detention areas in catchment	=	7.00	ha			
(D)	Size of 'isolated' portions of wetland	=	1.72	(FA =	0.06	)	
(E)	Size of coastal units of wetland complex	=	0.00	(FA =	0.00	)	

Points for Isolated Portion of Wetland (If not applicable, enter '0'):

(F)	(FA of D) x 100 pts	=	5.87	pts

Points for Coastal Portion(s) of Wetland (if not applicable, enter '0')

(G)	(FA of E) x 100 pts	=	0.00	pts

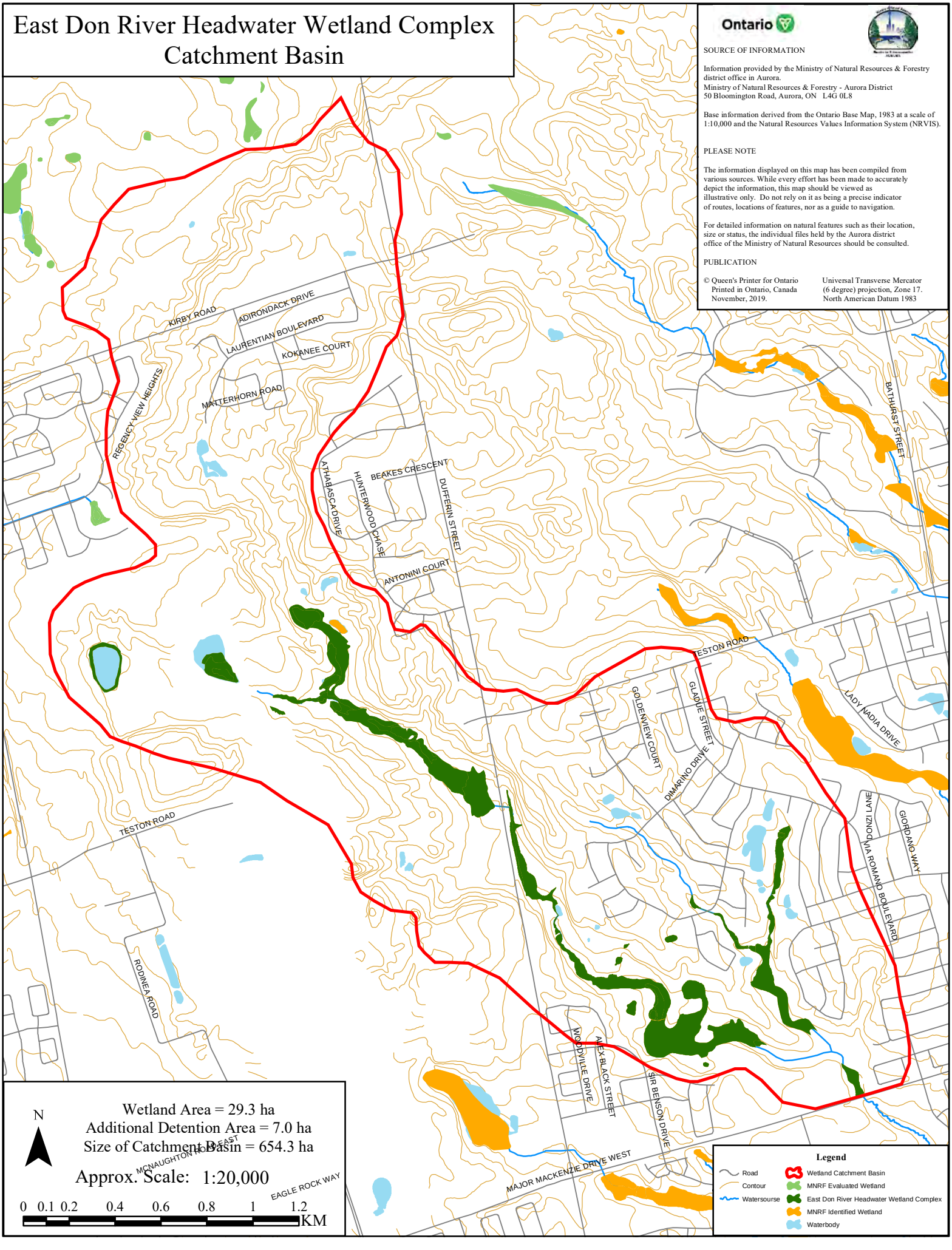
(H)	Size of wetland minus the isolated and coastal portions	=	{A – D – E}	=	27.58	ha
(I)	Number of points available to score 'rest' of wetland	=	{100 – F – G}	=	94.13	pts
(J)	Total area of upstream detention areas	=	{A + C }	=	36.30	ha

(K)	Upstream Detention Factor	{(H/J) x 2}	=	1.52	=	1.00	(maximum 1.0)
(L)	Attenuation Factor	{(H/B) x 10}	=	0.42	=	0.42	(maximum 1.0)

Flood Attenuation Final Score = {[((K + L) /2) x I] + F} = 66.90

Flood Attenuation Score 67
(maximum l00 points)

East Don River Headwater Wetland Complex Catchment Basin



Ontario

SOURCE OF INFORMATION

Information provided by the Ministry of Natural Resources & Forestry district office in Aurora.
Ministry of Natural Resources & Forestry - Aurora District
50 Bloomington Road, Aurora, ON L4G 0L8

Base information derived from the Ontario Base Map, 1983 at a scale of 1:10,000 and the Natural Resources Values Information System (NRVIS).

PLEASE NOTE

The information displayed on this map has been compiled from various sources. While every effort has been made to accurately depict the information, this map should be viewed as illustrative only. Do not rely on it as being a precise indicator of routes, locations of features, nor as a guide to navigation.

For detailed information on natural features such as their location, size or status, the individual files held by the Aurora district office of the Ministry of Natural Resources should be consulted.

PUBLICATION

© Queen's Printer for Ontario
Printed in Ontario, Canada
November, 2019.

Universal Transverse Mercator
(6 degree) projection, Zone 17.
North American Datum 1983

N

Wetland Area = 29.3 ha
Additional Detention Area = 7.0 ha
Size of Catchment Basin = 654.3 ha

Approx. Scale: 1:20,000

0 0.1 0.2 0.4 0.6 0.8 1 1.2 KM

Legend

- Road
- Contour
- Watersourse
- Wetland Catchment Basin
- MNRF Evaluated Wetland
- East Don River Headwater Wetland Complex
- MNRF Identified Wetland
- Waterbody

3.2 Water Quality Improvement

Step 1: Determination of maximum initial score

	Wetland on one of the 5 defined large lakes or 5 major rivers (Go to Step 5A)
x	All other wetlands (Go through Steps 2, 3, 4, and 5B)

Step 2: Determination of watershed improvement factor (WIF)

Calculation of WIF is based on the fractional area (FA) of each site type that makes up the total area of the wetland.

(FA= area of site type/total area of wetland)		Fractional Area					
FA of isolated wetland	=	0.06	x	0.5	=	0.03	(1.72 ha)
FA of riverine wetland	=	0.02	x	1	=	0.02	(0.51 ha)
FA of palustrine wetland with no inflow	=	0.92	x	0.7	=	0.65	(27.07 ha)
FA of palustrine wetland with inflows	=	0.00	x	1	=	0.00	(0.00 ha)
FA of lacustrine on lake shoreline	=	0.00	x	0.2	=	0.00	(0.00 ha)
FA of lacustrine at lake inflow or outflow	=	0.00	x	1	=	0.00	(0.00 ha)
			Sub Total:			0.70	

Sum (WIF cannot exceed 1.0) **0.70**

Step 3: Determination of catchment land use factor (LUF)

(Choose the first category that fits upstream landuse in the catchment)

	Over 50% agricultural and/or urban	=	1.0
0.8	Between 30 and 50% agricultural and/or urban	=	0.8
	Over 50% forested or other natural vegetation	=	0.6

LUF (maximum 1.0) **0.80**

Step 4: Determination of pollutant uptake factor (PUT)

Calculation of PUT is based on the fractional area (FA) of each vegetation type that makes up the total area of the wetland. Base assessment on the dominant vegetation form for each community except where dead trees or shrubs dominate. In that case base assessment on the domininant live vegetation. (FA = area of vegetation type/total area of wetland)

FA of wetland with live trees, shrubs, herbs or mosses (c,h,ts,ls,gc,m)	0.87	x	0.75	=	0.65	(25.48 ha)
FA of wetland with emergent,submergent or floating vegetation (re,be,ne,su,f,ff)	0.13	x	1	=	0.13	(3.70 ha)
FA of wetland with little or no vegetation (u)	0.00	x	0.5	=	0.00	(0.12 ha)
		Subtotal:			0.78	

Sum (PUT cannot exceed 1.0) **0.78**

Step 5: Calculation of final score

	Wetland on large lakes or major rivers	0
x	All other wetlands -calculate as follows	
	Initial score	60
	Water quality improvement factor (WIF)	0.70
	Land use factor (LUF)	0.80
	Pollutant uptake factor (PUT)	0.78
	Final score: 60 x WIF x LUF x PUT =	26.11

Short Term Water Quality Improvement Score 26
(maximum 60 points)

3.2.2 Long Term Nutrient Trap

Step 1:

	Wetland on large lakes or 5 major rivers	=	0 points
x	All other wetlands (proceed to Step 2)		

Step 2: Choose only one of the following settings that best describes the wetland being evaluated

	Wetland located in a river mouth	=	10 points
10	Wetland is a bog, fen or swamp with more than 50% of the wetland being covered with organic soil	=	10
	Wetland is a bog, fen or swamp with less than 50% of the wetland being covered with organic soil	=	3
	Wetland is a marsh with more than 50% of the wetland covered with organic soil	=	3
	None of the above	=	0

Long Term Nutrient Trap Score 10
(maximum 10 points)

3.2.3 Groundwater Discharge

Circle the characteristics that best describe the wetland being evaluated and then sum the scores. If the sum exceeds 30 points, assign the maximum score of 30). Note: for wetland type, wetland type scored does not have to the dominant type in the wetland.

Percentage of Wetland Area: 4.48 %

Wetland Characteristics	Potential for Discharge						
		None to Little		Some		High	
	Wetland type	Bog = 0		Swamp/Marsh = 2	2	Fen = 5	
	Topography	Flat/rolling = 0		Hilly = 2	2	Steep = 5	
	Wetland Area: Upslope Catchment Area	Large (>50%) = 0		Moderate (5-50%) = 2		Small <(5%) = 5	5
	Lagg Development	None found = 0		Minor = 2		Extensive = 5	
	Seeps	None = 0		= or < 3 seeps = 2		> 3 seeps = 5	5
	Surface marl deposits	None = 0		= or < 3 sites = 2		> 3 sites = 5	
	Iron precipitates	None = 0		= or < 3 sites = 2		> 3 sites = 5	
	Located within 1 km of a major aquifer	N/A = 0		N/A = 0		Yes = 10	10
	Totals		0		4		20

Additional Comments/Notes:

Oak Ridges Moraine aquifers

Groundwater Discharge Score 24
(maximum 30 points)

3.3 Carbon Sink

Check only one of the following:

	Bog, fen or swamp with more than 50% coverage by organic soil	=	5 points
	Bog, fen or swamp with between 10 to 49% coverage by organic soil	=	2
	Marsh with more than 50% coverage by organic soil	=	3
0	Wetlands not in one of the above categories	=	0

Carbon Sink Score 0
(maximum 5 points)

3.4 Shoreline Erosion Control

Step 1:

	Wetland entirely isolated or palustrine	=	0 points
x	Any part of the wetland riverine or lacustrine	=	Go to step 2

Step 2:

Choose the one characteristic that best describes the shoreline vegetation
see page 109 for description of "shoreline".)

15	Trees and shrubs	=	15 points
	Emergent vegetation	=	8
	Submergent vegetation	=	6
	Other shoreline vegetation	=	3
	No vegetation	=	0

Shoreline Erosion Control Score 15
(maximum 15 points)

3.5 Groundwater Recharge

3.5.1 Site Type

Wetland > 50% lacustrine (by area) or located on one of the five major rivers				=	0 points	
Wetland not as above. Calculate final score as follows:						
=	FA of isolated or palustrine wetland	=	0.98	x	50 =	49.0
=	FA of riverine wetland	=	0.02	x	20 =	0.4
=	FA of lacustrine wetland (wetland <50% lacustrine)	=	0.00	x	0 =	0.0
					Subtotal:	49.4

Groundwater Recharge/Wetland Site Type Score (maximum 50 points) **49**

3.5.2 Soil Recharge Potential

Circle only one choice that best describes the soils in the area surrounding the wetland being evaluated (the soils within the wetland are not scored here).

		Group A, B, C (sands, gravels, loams)		Group D (clays, substrates in high water tables, shallow substrates over impervious materials such as bedrock)	
Dominant Wetland Type	Lacustrine or major river	0		0	
	Isolated	10		5	
	Palustrine	7	7	4	
	Riverine (not on a major river)	5		2	
	Totals		7		0

Groundwater Recharge/Wetland Soil Recharge Potential Score (maximum 10 points) **7**

4.0 SPECIAL FEATURES COMPONENT

4.1 Rarity

4.1.1 Wetland Types

Ecodistrict	Rarity within the Landscape (4.1.1.1)	Rarity of Wetland Type (4.1.1.2)			
		Marsh	Swamp	Fen	Bog
6E-1	60	40	0	80	80
6E-2	60	40	0	80	80
6E-3	40	10	0	40	80
6E-4	60	40	0	80	80
6E-5	20	40	0	80	80
6E-6	40	20	0	80	80
6E-7	**60**	**10**	**0**	80	80
6E-8	20	20	0	80	80
6E-9	0	20	0	80	80
6E-10	20	0	20	80	80
6E-11	0	30	0	80	80
6E-12	0	30	0	60	80
6E-13	60	10	0	80	80
6E-14	40	20	0	40	80
6E-15	40	0	0	80	80
7E-1	60	0	60	80	80
7E-2	60	0	0	80	80
7E-3	60	0	0	80	80
7E-4	80	0	0	80	80
7E-5	60	20	0	80	80
7E-6	80	30	0	80	80

4.1.1.1 Rarity within the Landscape

Choose appropriate score from 2nd column above.

Rarity within the Landscape Score 60
(maximum 80 points)

4.1.1.2 Rarity of Wetland Type

Score is cumulative, based on presence/absence. Circle all appropriate scores from above table and sum.

Rarity of Wetland Type Score 10
(maximum 80 points)

4.1.2 Species

4.1.2.1 Reproductive Habitat for an Endangered or Threatened Species

Under the "Activity" column, when scoring animal species, record what the animal was doing when observed (e.g., nesting, courtship, singing, etc).

	Common Name	Scientific Name	Activity	Date Observed	Info Source
250	Redside Dace	Clinostomus elongatus			MECP
	see attached sheet 30A				
250	Total				

For each species score 250 points. (Score is cumulative, no maximum score)

Additional Notes/Comments:

Redside Dace is mapped by MECP as having occupied habitat along the Eat Don River upstream to the former Redelmeier dam, which includes Wetland No. 10, therefore it is assumed it is within the wetland complex

Reproductive Habitat for Endangered or Threatened Species **250**
(no maximum score)

4.1.2.2 Traditional Migration or Feeding Habitat for an Endangered or Threatened Species

Under the "Activity" column, when scoring animal species, record what the animal was doing when observed (e.g., nesting, courtship, singing, feeding, resting etc). Dates that species has been recorded using the wetland must be included in the table below.

	Common Name	Scientific Name	Activity	Date Observed	Info Source
	see attached sheet 30A				
150	Total				

For one species score 150 points; for each additional species score 75 points. (Score is cumulative)

Additional Notes/Comments:

Traditional Habitat for Endangered or Threatened Species **150**
(no maximum score)

4.1.2.3 Provincially Significant Animal Species

	Common Name	Scientific Name	Activity	Date Observed	Info Source
	see attached sheet 30A				
95	Total				

Additional Notes/Comments:

One	species	= 50 points	9	species	= 140	17	species	= 160
2	species	= 80	10	species	= 143	18	species	= 162
3	**species**	**= 95**	11	species	= 146	19	species	= 164
4	species	= 105	12	species	= 149	20	species	= 166
5	species	= 115	13	species	= 152	21	species	= 168
6	species	= 125	14	species	= 154	22	species	= 170
7	species	= 130	15	species	= 156	23	species	= 172
8	species	= 135	16	species	= 158	24	species	= 174
						25	species	= 176

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

Provincially Significant Animal Species 95
(no maximum score)

4.1.2.4 Provincially Significant Plant Species

	Common Name	Scientific Name	Activity	Date Observed	Info Source
0	Total				

Additional Notes/Comments:

none observed

One	species	= 50 points	9	species	= 140	17	species	= 160
2	species	= 80	10	species	= 143	18	species	= 162
3	species	= 95	11	species	= 146	19	species	= 164
4	species	= 105	12	species	= 149	20	species	= 166
5	species	= 115	13	species	= 152	21	species	= 168
6	species	= 125	14	species	= 154	22	species	= 170
7	species	= 130	15	species	= 156	23	species	= 172
8	species	= 135	16	species	= 158	24	species	= 174
						25	species	= 176

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

Provincially Significant Plant Species **0**
(no maximum score)

4.1.2.5 Regionally Significant Species

	Common Name	Scientific Name	Activity	Date Observed	Info Source
0	Total				

One	species	= 20 points	4	species	= 45	7	species = 58
2	species	= 30	5	species	= 50	8	species = 61
3	species	= 40	6	species	= 55	9	species = 64
						10	species = 67

For each significant species over 10 in wetland, add 1 point.

Regionally Significant Species Score 0
(no maximum score)

4.1.2.6 Locally Significant Species

	Common Name	Scientific Name	Activity	Date Observed	Info Source
	see attached sheet 30A				
38	Total				

One	species	= 10 points	4	species	= 31	7	species = 43
2	species	= 17	**5**	**species**	**= 38**	8	species = 45
3	species	= 24	6	species	= 41	9	species = 47
						10	species = 49

For each significant species over 10 in wetland, add 1 point.

Locally Significant Species Score 38
(no maximum score)

Significant Species – East Don River Headwater Wetland Complex

4.1.2.1 Reproductive Habitat for an Endangered or Threatened Species
Status: Based on Regulation 230/08 under the *Endangered Species Act*: E- provincially endangered species based on Species at Risk in Ontario List
Source: provincial mapping of Redside Dace occupied habitat on the East Don River
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Clinostomus elongatus* (Redside Dace) E; W10

4.1.2.2 Traditional Migration or Feeding Habitat for an Endangered or Threatened Species
Status: Based on Regulation 230/08 under the *Endangered Species Act*: T- provincially threatened species based on Species at Risk in Ontario List
Source: G- observed feeding over the wetlands and surrounding meadows by Joelle Pecora & Kim Logan GEM Services Inc. in 2017, 2018 and 2019)
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Hirundo rustica* (Barn Swallow) T; G W1, 2

4.1.2.3 Provincially Significant Animal Species
Status: SC- provincial species of special concern, N- species tracked by the OMNRF Natural Heritage Information Centre (NHIC)
Source: T- observations in 2001 & 2002 Paul Prior (TRCA), Z- observations in 2015 by Gavin Miller, Dell Tune & Sue Hayes (TRCA), G- Kim Logan & Joelle Pecora (GEM Services Inc.), M- July 4, 2018 observations by Kim Logan (GEM Services Inc.) & Steve Varga, Melanie Shapiera & Lauren Moretto (OMNRF, Aurora District)
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Chrysemsys picata marginata* (Midland Painted Turtle) N; G W1, 4; Z W5
2. *Contopus virens* (Eastern Wood-pewee) N, SC; T, Z, M W4
3. *Hylocichla mustelina* (Wood Thrush) N, SC; G, T W4

4.1.2.6 Locally Significant Plant Species (Rare in Ecodistrict 6E-7)
Status: Rare in Ecodistrict 6E-7, being known from 20 or less locations (Varga et al. 2004)
Source: T- Natalie Iwanicki and Gavin Miller Toronto and Region Conservation Authority (2002, 2009, 2015), G- GEM Services Inc.
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Carex alopecoidea* (Foxtail Wood Sedge) T W4
2. *Carex aquatilis* (Water Sedge) T W4
3. *Nymphaea odorata* (White Water-lily) G W4
4. *Solidago patula* (Rough-leaved Goldenrod) T W4
5. *Stellaria longifolia* (Long-leaved Stitchwort) T W4

Locally Uncommon Plant Species (Uncommon in Ecodistrict 6E7)*
Status: Uncommon in Ecodistrict 6E-7, being known from 21 to 40 or less locations (Varga et al. 2004)
Source: T- Natalie Iwanicki and Gavin Miller Toronto and Region Conservation Authority (2002, 2009, 2015), G- GEM Services Inc., V- June 14, 2017 Kim Logan (GEM Services Inc.) & Steve Varga, Thivyah Sivasubramianum & Austeja Vaskeviciute (OMNRF, Aurora District)
Location: The wetland in which the species occurs is indicated by wetland number from W1 to W11
1. *Aralia racemosa* (Spikenard) T W4
2. *Carex laevivaginata* (Smooth-sheathed Sedge) T W4, 11
2. *Carex scabrata* (Rough Sedge) T W4, 11
3. *Chrysosplenium americanum* (Golden Saxifrage) T W4
4. *Dryopteris clintoniana* (Clinton's Wood Fern) T W4
4. *Equisetum scirpoides* (Dwarf Horsetail) T W4
5. *Equisetum sylvaticum* (Woodland Horsetail) T W4
6. *Lemna trisulca* (Star Duckweed) T W7, 11
7. *Pilea fontana* (Spring Clearweed) T W11
8. *Spirodela polyrhiza* (Greater Duckweed) T W11
9. *Stuckenia pectinata* (Sago Pondweed) V W2; T W4

10. *Veronica americana* (American Speedwell) T W4

*Locally uncommon plant species provided are not assigned points in the wetland scoring record but are provided as one of the reasons for the inclusion of wetland units less than two hectares in size. one of the reasons for the inclusion of wetland units less than two hectares in size.

4.2 Significant Features and Habitats

4.2.1 Colonial Waterbirds

Record all available information. Score the highest applicable category. Include additional information as possible (e.g., nest locations, etc).

Activity	Species	Info Source	Points	
Currently nesting			= 50	
Known to have nested within the past 5 years			= 25	
Active feeding area (great blue heron excluded)			= 15	
None known			= 0	
Total:				0

Additional Notes/Comments:

not observed by GEMS or TRCA

Colonial Waterbird Nesting Score 0
(maximum 50 points)

4.2.2 Winter Cover for Wildlife

Score highest appropriate category. Include rationale/sources of information.

	Provincially significant	=	00 points
	Significant in Ecoregion	=	50
	Significant in Ecodistrict	=	25
10	Locally significant	=	10
	Little or poor winter cover	=	0
10			

Species/habitat/vegetation community scored (e.g., winter deer cover in hemlock swamp, S3 and S4b):

ponds for painted turtle hibernation and winter deer area in the conifer and mixed swamps

Source of information:

significant wildlife habitat technical guide, GEMS & TRCA observatios

Winter Cover for Wildlife Score 10
(maximum 100 points)

4.2.3 Waterfowl Staging and/or Moulting Areas

Check highest level of significance for both staging and moulting; add scores for staging and for moulting together for final score. However, maximum score for evaluation under this section is 150 points.

	Staging			Moulting		
Nationally/internationally significant	= 150		points	= 150		points
Provincially significant	= 100			= 100		
Significant in the Ecoregion	= 50			= 50		
Significant in Ecodistrict	= 25			= 25		
Known to occur	= 10	**10**		= 10		
Not possible/Unknown	= 0			= 0		
Subtotal:		**10**			**0**	
Total:			**10**			

Species/habitat/vegetation community scored (e.g., approx 20 mallards in W3):

ducks observed staging in open water marshes and ponds within the wetland complex

Source of information:

GEMS observations

Waterfowl Staging/ Moulting Score **10**
(maximum 150 points)

4.2.4 Waterfowl Breeding

Check highest level of significance.

	Nationally/ internationally significant	=	150 points
	Provincially significant	=	100
	Significant in the Ecoregion	=	50
	Significant in Ecodistrict	=	25
10	Habitat Suitable	=	10
	Habitat not suitable	=	0

Species/habitat/vegetation community scored (e.g., mallard in W3):

open water marshes in the weltand complex provide suitable habitat

Source of information:

GEMS observations

Waterfowl Breeding Score **10**
(maximum 100 points)

4.2.5 Migratory Passerine, Shorebird or Raptor Stopover Area

Check highest level of significance.

	Nationally/ internationally significant	=	150 points
	Provincially significant	=	100
	Significant in Ecoregion	=	50
	Significant in Ecodistrict	=	25
10	Known to occur	=	10
	Not possible/ Unknown	=	0

Species/habitat/vegetation community scored:

species passing through (Red-winged blackbirds etc.)

Source of information:

GEMS observations

Passerine, Shorebird or Raptor Stopover Score **10**
(maximum 100 points)

4.2.6 Fish Habitat

4.2.6.1 Spawning and Nursery Habitat

Area Factors for Low Marsh, High Marsh and Swamp Communities.

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5- 4.9	0.2
5.0- 9.9	0.4
10.0- 14.9	0.6
15.0 -19.9	0.8
20.0+ ha	1.0

Step 1:

[ ]	Fish habitat is not present within the wetland	Go to Step 7, Score 0 points
[x]	Fish habitat is present within the wetland	Go to Step 2

Step 2: Choose only one option

[x]	Significance of the spawning and nursery habitat within the wetland is known	Go to Step 3
[ ]	Significance of the spawning and nursery habitat within the wetland is not known	Go through Steps 4, 5 and 6

Step 3: Select the highest appropriate category below, attach documentation:

[ ]	Significant in Ecoregion	Go to Step 7,	l00 points
[ ]	Significant in Ecodistrict	Go to Step 7,	50
[ ]	Locally Significant Habitat (5.0+ ha)	Go to Step 7,	25
[x]	Locally Significant Habitat (<5.0 ha)	Go to Step 7,	15

Subtotal: 15

Source of information:

MNRF Management Biologist & Aurora Fish Files (see attached sheets 33A)

Step 4: Low Marsh = the 'permanent' marsh area, from the existing water line out to the outer boundary of the wetland.

[ ]	Low marsh not present	Go to Step 5
[ ]	Low marsh present	Continue through Step 4, scoring as noted below

Fish Records in and Around the East Don River Headwater Wetland Complex					
Based on records from the East Don River and its tributaries in the Don River watershed (MNRF Aurora District fish file records)					
Locality of Station	**Fish Dot**	**Date (d/m/y)**	**Collectors**	**Caught**	**Species**
500 metres east of Dufferin Street in Wetland No. 4	111	10/07/1972	Anderson Taylor	15	Brook Trout
50 metres east of Dufferin Street in Wetland No. 4	1	03/07/1984	D. Martin S. Smith	87 60	Northern Redbelly Dace Eastern Blacknose Dace
		04/08/1992	Wichert	39 2 8	Brown Trout Brook Trout Pumpkinseed
		06/08/1992	Wichert	1 15 3 1 50 79 24	Rainbow Trout Pumpkinseed Brown Trout Brook Trout Northern Redbelly Dace Eastern Blacknose Dace Brook Stickleback
		19/04/1993	N/A	1 23 4	Northern Redbelly Dace Eastern Blacknose Dace Brook Stickleback
		25/08/1994	Slessor Semonsly	1 111 10	Northern Redbelly Dace Eastern Blacknose Dace Brook Stickleback
Westside of Dufferin Street in Wetland No. 4	116	27/05/1984	N/A	41 33	Eastern Blacknose Dace Northern Redbelly Dace
		18/07/1985	Steedman	15 8	Northern Redbelly Dace Eastern Blacknose Dace
Just east of Dufferin	131	22/05/1984	Steedman	41 33	Eastern Blacknose Dace Northern Redbelly Dace
Aound both sides of Dufferin Street, in Wetland No. 4	15	18/07/1985	N/A	15 8	Northern Redbelly Dace Eastern Blacknose Dace
		25/10/1991	W. Ramshaw A. Brown	68 92	Northern Redbelly Dace Eastern Blacknose Dace

Totten Sims Hubicki report (172)		11/06/1992	Slessor	22 4	Eastern Blacknose Dace Brook Stickleback
		27/07/1998	Jogn Clayton Georgina Fodor Jason Darisi	41 3	Eastern Blacknose Dace Brook Stickleback
West of Dufferin Street in Wetland No. 4		25/11/2003	Sean Stuart Mark Cece	27 28	Brook Stickleback Northern Redbelly Dace
Located in the eastern tributary of the East Don River in Wetland No. 11	148	10/08/1992	Wichert	9	Mottled Sculpin
Located on the north side of Major Mackenzie Drive in the East Don River in Wetland No. 10	6	07/10/1991	A. Brown W. Ranshaw	240 77 11 5 105 35	Creek Chub White Sucker Largemouth Bass Pumpkinseed Eastern Blacknose Dace Longnose Dace
		15/10/1997	J. Harrison G.Fodor	62 24 17 2 2 2 14 52 65	White Sucker Creek Chub Common Shiner Largemouth Bass Brook Stickleback Fathead Minnow Bluntnose Minnow Longnose Dace Blacknose Dace
		13/08/1998	Geogina Fodor Jason Darisi	51 42 31 233 11 3 37 3 27	Blacknose Dace Bluntnose Minnow Common Shiner Creek Chub Fathead Minnow Largemouth Bass Longnose Dace Pumpkinseed White Sucker

Located on the south side of Major Mackenzie Drive in the East Don River just south of Wetland No. 10	29	12/07/1984	D. Martin	14	White Sucker
			S. Smith	2	Bluntnose Minnow
				14	Eastern Blacknose Dace
				3	Longnose Dace
				34	Creek Chub
				3	Yellow Perch
		06/08/1992	Wichert	153	Creek Chub
				37	Longnose Dace
				23	White Sucker
				64	Eastern Blacknose Dace
				7	Pumpkinseed
				21	Bluntnose Dace
				1	Yellow Perch
				1	Brook Stickleback
		06/07/1994	C. Hopkins	156	Creek Chub
			H. Orr	59	White Sucker
			Tim C.	9	Pumpkinseed
			John T.	84	Eastern Blacknose Dace
				5	Largemouth Bass
				9	Spottail Shiner
				19	Longnose Dace
		25/10/1995	T. Couey	43	White Sucker
			S. Wurts	139	Creek Chub
			P. Donnelly	17	Common Shiner
			W. Whitehouse	3	Pumpkinseed
				1	Fathead Minnow
				1	Largemouth Bass
				21	Blacknose Dace
				1	Spottail Shiner
				3	Longnose Dace
		13/08/1998	Georgina Fodor	27	Longnose Dace
			Jason Darisi	21	Common Shiner
				41	Eastern Blacknose Dace
				32	Bluntnose Minnow
				7	Fathead Minnow
				223	Creek Chub
				17	White Sucker
				3	Pumpkinseed
				3	Largemouth Bass

Scoring of Low Marsh:

1. Check the appropriate **Vegetation Group** (see Appendix 7) for each Low Marsh community. (Based on the one most clearly dominant plant species of the dominant form in each Low Marsh vegetation community.)
2. Sum the areas (ha) of the vegetation communities assigned to each **Vegetation Group.**
3. Use these areas to assign an **Area Factor** for each checked **Vegetation Group**.
4. Multiply the **Area Factor** by the **Multiplication Factor** for each row to calculate Score.
5. Sum all numbers in Score column to get **Total Score for Low Marsh**.

Scoring for Presence of Key Vegetation Groups Low Marsh						
Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (from Table 8)	Multiplication Factor	Score
1	Tallgrass				6	**0.0**
2	Shortgrass-Sedge				11	**0.0**
3	Cattail-Bulrush-Burreed				5	**0.0**
4	Arrowhead-Pickerelweed				5	**0.0**
5	Duckweed				2	**0.0**
6	Smartweed-Waterwillow				6	**0.0**
7	Waterlily-Lotus				11	**0.0**
8	Waterweed-Watercress				9	**0.0**
9	Ribbongrass				10	**0.0**
10	Coontail-Naiad-Watermilfoil				13	**0.0**
11	Narrowleaf Pondweed				5	**0.0**
12	Broadleaf Pondweed				8	**0.0**
			Subtotal Score			**0.0**
			Total Score for Low Marsh (maximum 75 points)			**0.0**

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5- 4.9	0.2
5.0- 9.9	0.4
10.0- 14.9	0.6
15.0 -19.9	0.8
20.0+ ha	1.0

Step 5: High Marsh = the 'seasonal' marsh area, from the water line to the inland boundary of marsh wetland type. This is essentially what is commonly referred to as a wet meadow, in that there is insufficient standing water to provide fisheries habitat except during flood or high water conditions.

☐ High marsh not present — Go to Step 6

☐ High marsh present — Continue through Step 5, scoring as noted below

Scoring of High Marsh:

1. Check the appropriate **Vegetation Group** (see Appendix 7) for each High Marsh community. (Based on the one most clearly dominant plant species of the dominant form in each High Marsh vegetation community.)
2. Sum the areas (ha) of the vegetation communities assigned to each **Vegetation Group.**
3. Use these areas to assign an **Area Factor** (from Table 8) for each checked **Vegetation Group**.
4. Multiply the **Area Factor** by the **Multiplication Factor** for each row to calculate Score.
5. Sum all numbers in Score column to get **Total Score for High Marsh**.

Scoring for Presence of Key Vegetation Groups High Marsh						
Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (from Table 8)	Multiplication Factor	Score
1	Tallgrass	x			6	**0.0**
2	Shortgrass-Sedge				11	**0.0**
3	Cattail-Bulrush-Burreed	x			5	**0.0**
4	Arrowhead-Pickerelweed				5	**0.0**
		Subtotal Score				**0.0**
		Total Score for High Marsh (maximum 25 points)				**0.0**

Continue to Step 6

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5- 4.9	0.2
5.0- 9.9	0.4
10.0- 14.9	0.6
15.0 -19.9	0.8
20.0+ ha	1.0

Step 6:

Scoring of Swamp:
1. Determine the total area (ha) of seasonally flooded swamp communities within the wetland containing fish habitat and record below.
2. Determine the total area (ha) of permanently flooded swamp communities within the wetland containing fish habitat and record below.
3. Use these areas to assign an **Area Factor** (from Table 8).
4. Multiply the Area Factor by the **Multiplication Factor** for each row to calculate Score.
5. Sum all numbers in Score column to get **Total Score for Swamp**.

Scoring Swamps for Fish Habitat (Seasonally flooded; Permanently flooded)					
Swamp Containing Fish Habitat	Present (check)	Total Area (ha)	Area Factor (from Table 8)	Multiplication Factor	Score
Seasonally Flooded Swamp	x			10	0.0
Permanently Flooded Swamp	x			10	0.0
	Subtotal Score				0.0
	Total Score for Swamp (maximum 20 points) Continue to Step 7				0.0

Step 7: CALCULATION OF FINAL SCORE

NOTE: Scores for Steps 4, 5 and 6 are only recorded if Steps 1 and 3 have not been scored.

A. Score from Step 1 (fish habitat not present)	=	0
B. Score from Step 3 (significance known)	=	15
C. Score from Step 4 (Low Marsh)	=	0
D. Score from Step 5 (High Marsh)	=	0
E. Score from Step 6 (Swamp)	=	0
Subtotal:		15

Calculation of Final Score for Spawning and Nursery Habitat = A or B or Sum of C, D, and E

Score for Spawning and Nursery Habitat (maximum 100 points) **15**

4.2.6.2 Migration and Staging Habitat

Step 1:

[ ]	Staging or Migration Habitat is not present in the wetland	Go to Step 4, Score 0 points
[X]	Staging or Migration Habitat is present in the wetland significance of the habitat is known	Go to Step 2
[ ]	Staging or Migration Habitat is present in the wetland significance of the habitat is not known	Go to Step 3

Step 2: Select the highest appropriate category below. Ensure that documentation is attached to the data record.

[ ]	Significant in Ecoregion	Score 25 points in Step 4
[ ]	Significant in Ecodistrict	Score 15 points in Step 4
[10]	Locally Significant	Score 10 points in Step 4
[5]	Fish staging and/or migration habitat present, but not as above	Score 5 points in Step 4

Source of information:

MNRF Aurora District Management Biologist

Step 3: Select the highest appropriate category below based on presence of the designated site type (i.e. does not have to bethe dominant site type). Refer to Site Types recorded earlier (section 1.1.3). Attach documentation.

[ ]	Wetland is riverine at rivermouth or lacustrine at rivermouth	Score 25 points in Step 4
[ ]	Wetland is riverine,within 0.75 km of rivermouth	Score 15 points in Step 4
[ ]	Wetland is lacustrine,within 0.75 km of rivermouth	Score 10 points in Step 4
[ ]	Fish staging and/or migration habitat present, but not as above	Score 5 points in Step 4

Step 4: Enter a score from only one of the three above Steps.

Score for Staging and Migration Habitat (maximum 25 points) **10**

4.3 Ecosystem Age

		Fractional Area				Scoring
Bog	=	0.00	x	25	=	0.0
Fen, on deeper soils; floating mats or marl	=	0.00	x	20	=	0.0
Fen, on limestone rock	=	0.00	x	5	=	0.0
Swamp	=	0.87	x	3	=	2.6
Marsh	=	0.13	x	0	=	0.0
				Subtotal:		2.6

Ecosystem Age Score 3
(maximum 25 points)

4.4 Great Lakes Coastal Wetlands

Choose one only. Only coastal wetland units may be scored.

	wetland < 10 ha	=	10 points
	wetland 10 - 50 ha	=	25
	wetland 51 - 100 ha	=	50
	wetland > 100 ha	=	75

Great Lakes Coastal Wetland Score 0
(maximum 75 points)

5.0 DOCUMENTATION OF WETLAND FEATURES NOT INCLUDED IN THE EVALUATION

5.1 Invasive Species

Attach documentation of invasive species found in wetland (include location information and a coarse estimate of abundance [F = few, C = fairly common, A = abundant]):

C- phragmities in Wetland No. 3, other small occurences within other wetlands (garlic mustard, manitoba maple, buckthorn)

5.2 Vernal Pools

Documentation of information on vernal pools encountered during the wetland evaluation but not included as part of the evaluated wetland.

none encounted during evaluation but some known to occur based on previous investigations

5.3 Species of Special Interest

5.3.1 Osprey

Check all that apply:

	Present and nesting
	Known to have nested in last 5 yr
	Feeding area for osprey
x	Not as above

5.3.2 Common Loon

Check all that apply:

	Nesting in wetland
	Feeding at edge of wetland
	Observed or heard on lake or river adjoining the wetland
x	Not as above

5.4 Important Drinking Water Area

Wetland located within:
(check all that apply)

	Wellhead Protection Area
	Intake Protection Zone
x	Significant Recharge Area
x	Vulnerable Aquifer Area

Source of information:

York Region Official Plan Maps 6,7,13,and 14

Additional Comments:

5.5 Area of Wetland Restoration Potential

Check all that apply. Attach additional pages if necessary.

[x] Area of wetland restoration potential adjacent to evaluated wetland unit(s)

[ ] Area of wetland restoration potential within 750m of evaluated wetland unit(s), but not adjacent

[ ] Area of wetland restoration potential encountered elsewhere

[x] Area currently functioning as wetland (e.g., showing signs of degradation but still mapped as wetland).

[ ] Adjacent Wetland Unit (if applicable): _____

[ ] GPS Coordinates of Site: _____

Description of site (e.g., current land use, wetland characteristics of site, etc) and why it is identified as an area of restoration potential:

Wetland Unit 2 has a large colony of phragmities with smaller amount in Wetland Unit 1. It is proposed to remove this invasive species

The potential for wetland restoration is high because the North Maple Regional Park is being developed around Wetland Units 1, 2 and 3

Additional Notes/Comments (e.g., adjacent lands, etc)

Flora in and around the East Don River Headwater Wetland Complex

Legend: **Observers**: **M1**- Steve Varga (OMNR Maple District) 1995 observations, **M2**- June 14, 2017 observations of Steve Varga, Thivyah Siva & Austeja Vaskeviciute (OMNRF Aurora District) & Kim Logan (GEM Services Inc.) & July 18, 2018 observations of Steve Varga, Melanie Shapiera & Lauren Moretto (OMNRF, Aurora District), Timothy Law (Ontario Streams) & Kim Logan (GEM Services Inc.); **G**- Joelle Pecora & Kim Logan (GEM Services Inc) 2017 & 2018 observations; **T1**- Natalie Iwanicki (TRCA) observations May 13, June 1, 12, 14, July 18, 30, August 13, 2001; **T2**- Gavin Miller (TRCA) observations 2009, **T3**- Gavin Miller (TRCA) observations 2015; **Status**: **X**- introduced taxa, **P**- planted species, **N**- common native species, **PE**- provincially endangered, **LR-** locally rare & **LU**- locally uncommon native species in Ecodistrict 6E7 based on Varga et al. 2004; *****- plants marked with an asterisk occur in the wetland complex

Latin Name	Common Name	Observer	Status
*Abies balsamea**	Balsam Fir*	M1,T2	N
*Acer negundo**	Manitoba maple *	M1, G, T2,T3	N
*Acer rubrum**	red maple *	M1, G, T2,T3	N
Acer platanoides	Norway maple	T2,T3	X
*Acer saccharinum**	silver maple*	T3	N
*Acer saccharum**	sugar maple *	M1, G, T2,T3	N
*Acer spicatum**	mountain maple*	M1,M2, T3	N
*Acer Xfreemanii**	hybrid swamp maple*	T3	N
Achillea millefolium	common yarrow	G, T2,T3	X
Actaea pachypoda	white baneberry *	M1, G, T2,T3	N
Actaea rubra	red baneberry	M1, T2,T3	N
Actaea Xludovici	hybrid baneberry	T3	N
Adiantum pedatum	northern maidenhair fern	T3	N
Aegopodium podagraria	goutweed	T2	X
*Ageratina altissima**	white snakeroot*	M1, T2,T3	N
*Agrimonia gryposepala**	hooked agrimony *	G, T2,T3	N
*Agrostis gigantea**	redtop grass*	M1, G, T2,T3	X
*Agrostis stolonifera**	creeping bent grass*	M1, T2,T3	X
*Ailanthus altissima**	tree of heaven *	G	X
*Alisma triviale**	water-pantain*	T2,T3	N
Alliaria petiolata	garlic mustard	M1, G, T2,T3	X
Allium tricoccum	wild leek	T3	N
Amorpha fruticosa	shrubby false indigo	T2	X
Amphicarpaea bracteata	hog-peanut	M1, T2,T3	N
Anemone acutiloba	sharp-lobed hepatica	M1, T1,T2,T3	N
Anemone americana	round-lobed hepatica	T1	N
Anemone canadensis	Canada anemone *	G, T3	N
Anemone virginiana	common thimbleweed	M1, T2,T3	N
Antennaria howellii ssp. *howellii*	Howell's pussytoes	T2,T3	N
*Alnus glutinosa**	european alder*	T3	X

*Alnus incana**	speckled alder *	M1, G, T2,T3	N
Ambrosia artemisiifolia	common ragweed	M1, G, T2,T3	X
Amelanchier arborea	downy serviceberry	T2,T3	N
Amelanchier interior	serviceberry complex	T3	N
Apocynum androsaemifolium	spreading dogbane	M1, T2,T3	N
Apocynum cannabinum	indian hemp	T2,T3	N
Aquilegia canadensis	columbine	M1, T1,T2,T3	N
*Aralia nudicaulis**	wild sarsaparilla *	M1, G, T2,T3	N
*Aralia racemosa**	Spikenard*	M1, T2,T3	LU*
Arctium minus	common burdock	M1, T2,T3	X
Arenaria serpyllifolia	thyme-leaved sandwort	T2	X
Arisaema triphyllum	Jack-in-the-pulpit	M1, G, T2,T3	N
Asarum canadense	wild ginger	M1, G, T2,T3	N
Ascelpias exaltata	poke milkweed	M1	LR
*Asclepias incarnata**	swamp milkweed*	T3	N
Asclepias syriaca	common milkweed	M1, G, T2,T3	N
Asparagus officinalis	asparagus	T3	X
*Athyrium filix-femina**	northeastern lady fern*	M1, T2,T3	N
Barbarea vulgaris	winter cress	T3	X
Berberis thunbergii	Japanese barberry	M1, T2,T3	X
*Betula alleghaniensis**	yellow birch*	M1,M2, T2,T3	N
*Betula papyrifera**	paper birch *	M1, G, T2,T3	N
*Bidens cernua**	nodding bur-marigold*	M1, T2,T3	N
*Bidens frondosa**	common beggar's-ticks*	T2,T3	N
*Boehmeria cylindrica**	false nettle*	T3	N
Bromus commutatus	upright chess	T3	X
*Bromus inermis**	smooth bromegrass*	M1, G, T2,T3	X
Bromus japonicus	Japanese chess	T3	X
Bromus racemosus	spiked brome	T3	X
Bromus tectorum	downy chess	T2	X
*Calamagrostis canadensis**	Canada blue joint*	T3	N
*Caltha palustris**	marsh marigold*	T2,T3	N
*Campanula rapunculoides**	creeping bellflower *	G, T2	X
Cardamine concatenata	cut-leaf toothwort	T2	N
Cardamine diphylla	broad-leaved toothwort	T3	N
*Cardamine pensylvanica**	Pennsylvania bitter cress*	T2	LU*
Carduus acanthoides	plumeless thistle	T3	X
Carduus nutans	nodding thistle	T2,T3	X
Carex albursina	white-bear sedge	T2	N
*Carex alopecoidea**	foxtail wood sedge	T2,T3	LR*
*Carex aquatlis**	water sedge*	T1	LR*
Carex arctata	nodding wood sedge	M1, T3	N
*Carex aurea**	golden sedge*	T2,T3	LU*

Carex backii	Back's sedge	T2	LR
*Carex bebbii**	Bebb's sedge*	T3	N
Carex blanda	common wood sedge	M1	N
Carex cephalophora	oval-headed sedge	T2,T3	LU
Carex communis	fibrous-rooted sedge	M1, T1,T2,T3	N
*Carx cristatella**	crested sedge*	M1	N
Carex deweyana	Dewey's sedge	M1, T2,T3	N
Carex digitalis	narrow-leaved wood sedge	M1	LR
*Carex disperma**	two-seeded sedge*	T1,T2,T3	N
*Carex granularis**	meadow sedge	T2,T3	N
Carex hitchcockiana	hitchcock sedge	T2	LU
Carex houghtoniana	Houghton's sedge	T3	LR
*Carex hystericina**	purcupine sedge*	T2,T3	N
*Carex interior**	inland sedge	M1, T2	N
*Carex laevivaginata**	smooth-sheathed sedge*	M1, T2,T3	N
Carex laxiflora	loose-flowered sedge	M1, T2,T3	LU
*Carex leptalea**	bristle-stalked sedge	T3	N
Carex leptonervia	few-nerved sedge	T2,T3	N
Carex peckii	Peck's sedge	T2,T3	N
*Carex pedunculata**	pedunculed sedge	M1, T3	N
Carex pensylvanica	Pennsylvania sedge	M1, G, T3	N
Carex platyphylla	borad-leaved sedge	M1, T1,T2,T3	LU
*Carex projecta**	necklace sedge*	M1	N
*Carex pseudocyperus**	cyperus-like sedge*	T2	N
*Carex radiata**	straight-styled sedge*	M1, T2,T3	N
*Carex retrorsa**	retrorse sedge*	T3	N
Carex rosea	curly-styled sedge	M1, T2,T3	N
*Carex scabrata**	rough sedge*	M1, T1,T2,T3	LU*
Carex sparganoides	bur-reed sedge	T2,T3	N
Carex spicata	spiked sedge	T2,T3	X
*Carex stipata**	awl-fruited sedge*	M2, T2,T3	N
*Carex vulpinoidea**	fox sedge	T2,T3	N
Carya cordiformis	bitternut hickory	M1, G, T2,T3	N
Caulophyllum giganteum	giant cohosh	M1, G, T2,T3	N
Celastrus orbiculatus	oriental bittersweet	T2,T3	X
Centaurea stoebe ssp. *micranthos*	spotted knapweed	T3	X
Cerastium fontanum	mouse-ear chickweed	T2,T3	X
*Ceratophyllum demersum**	common coontail	T3	LU*
Chelidonium majus	celandine	T2	X
Chenopodium album	lamb's quarters	T3	X
Chrysosplenium americanum	golden saxifrage	M1, T2,T3	LU*
Cichorium intybus	common chicory	M1, G, T2,T3	X
*Cicuta bulbifera**	bulb-bearing water-hemlock*	M1,T2,T3	N

*Cinna latifolia**	nodding wood reed*	T3	N
Circaea alpina	smaller enchanter's nightshade	T3	N
Circaea canadensis (C. lutiana)*	enchanter's nightshade *	M1, G, T2,T3	N
Cirsium arvense	Canada thistle	M1, G, T2,T3	X
Cirsium vulgare	bull thistle	G, T2,T3	X
Claytonia caroliniana	Carolina spring-beauty	T2,T3	LU
Clematis virginiana	virgin's bower	T2,T3	N
Clintonia borealis	blue-bead lily	G, T1,T2,T3	N
Convallaria majalus	lily-of-the-valley	T3	X
Convolvus arvensis	field bindweed	G, T3	X
*Cornus alternifolia**	alternate-leaf dogwood *	M1,G, T2,T3	N
Cornus racemosa	grey dogwood	T2	N
Cornus rugosa	round-leaved dogwood	G, T2	N
*Cornus sericea**	red-osier dogwood*	M2,T2,T3	N
Corylus cornuta	beaked hazel	M1,T2	N
Crataegus holmesiana	Holmes' hawthorn	T3	LU
Crataegus macracantha	long-spined hawthorn	T2,T3	N
Crataegus macrosperma	variable hawthorn	T3	LU
Crataegus monogyna	English hawthorn	T2,T3	N
Crataegus punctata	dotted hawthorn	T2,T3	N
Crataegus Xninae-celottiae	English - dotted hybrid hawthorn	T3	X
Crepis tectorum	narrow-leaved hawk's beard	T3	X
*Cystopteris bulbifera**	bulblet fern*	M1, T2,T3	N
Cystopteris tenuis	Mackay's brittle fern	T1	LU
Dactylis glomerata	orchardgrass	M1, G, T2,T3	X
Danthonia spicata	poverty oat grass	T3	N
Daucus carota	wild carrot	M1, G, T2,T3	X
Desmodium canadense	showy tick-trefoil	T3	N
Desmodium glutinosum	pointed-leaf tick-trefoil	M1, G, T2	N
Dicentra canadensis	squirrel-corn	T2	LU
Diervilla lonicera	bush-honeysuckle	M1, T2,T3	N
Diphaiastrum digitatum	ground-cedar	T1	LU
Dipsacus fullonum	teasel	G	X
Dirca palustris	leatherwood	M1,T2	LU
Dryopteris carthusiana	spinulosa wood fern	M1, T2,T3	N
*Dryopteris clintoniana**	clinton's wood fern*	T1,T2,T3	LU*
*Dryopteris cristata**	crested wood fern*	T1,T3	N
*Dryopteris intermedia**	evergreen wood fern*	M1, T2,T3	N
Dryopteris marginalis	marginal wood fern	M1, T2,T3	N
Dryopteris Xtriploidea	hybrid wood fern	T3	N
Echinochloa crus-galli	barnyard grass	T3	X
Echinocystis lobata	wild cucumber	T2	N
Echium vulgare	viper's bugloss	T3	X

Elaeagnus umbellata	autumn olive	T2,T3	X
*Eleocharis erythropoda**	creeping spike-rush*	T2,T3	N
Elymus repens	quackgrass	M1, G, T2,T3	X
*Elymus virginicus**	Virginia wild rye*	T3	N
Epifagus virginiana	beech-drops	M1, T2,T3	N
*Epilobium ciliatum**	sticky willow-herb*	M1, T2,T3	N
Epilobium coloratum	purple-leaved willow-herb*	T3	LR*
*Epilobium hirsutum**	greater wilow-herb*	T2,T3	X
*Epilobium parviflorum**	small-flowered willow-herb	M1, T2,T3	X
Epipactis helleborine	helleborine	M1, T2,T3	X
Eragrostis minor	little love grass	T3	
*Equisetum arvense**	field horsetail*	M1,M2,G,T2,T3	N
*Equisetum fluviatile**	water horsetail	T3	N
*Equisetum hyemale**	scouring rush*	M2, T2,T3	N
*Equisetum scirpoides**	dwarf horsetail*	M1, T2,T3	LU*
*Equisetum sylvaticum**	woodland horestail*	T2	LU*
*Equisetum variegatum**	variegated horsetail*	T1,T3	LU*
Erigeron annuus	daisy fleabane	M1, G, T2,T3	N
Erigeron canadensis	horse-weed	T3	N
Erigeron philadelphicus	Philadelphia fleabane	T2,T3	N
Erucastrum gallicum	dog mustard	T3	X
Erysimum cheiranthoides	wormseed mustard	T3	X
*Erythronium americanum**	trout lily *	M1, G, T2,T3	N
Euonymus europaeus	European spindle-tree	T2,T3	X
*Eupatorium perfoliatum**	boneset*	M1, T2,T3	N
Eurybia macrophylla	big-leaved aster	M1, T2,T3	N
*Euthamia graminifolia**	grass-leaved goldenrod*	T2,T3	N
*Eutrochium maculatum**	spotted Joe-pye-weed*	M1,M2, T2,T3	N
*Fagus grandifolia**	American beech *	M1, G, T2,T3	N
Fallopia convolvulus	black bindweed	T2	X
Festuca rubra	red fescue	T2,T3	N
*Fragaria vesca**	woodland strawberry *	M1, G, T2,T3	N
Fragaria virginiana	wild strawberry	M1, T2,T3	N
*Fraxinus americana**	white ash *	M1, G, T2,T3	N
*Fraxinus nigra**	black ash*	M1, T1,T2,T3	N
*Fraxinus pennsylvanica**	green ash*	M2,T2,T3	N
Galeopsis tetrahit	hemp-nettle	T3	X
Galium aparine	cleavers	T3	LU
*Galium asprellum**	rough bedstraw*	M2	LU*
Galium boreale	northern bedstraw	T2	LR
Galium palustre	marsh bedstraw	T2,T3	N
Galium triflorum	sweet-scented bedstraw	M1, T2,T3	N
*Galium verum**	yellow bedstraw *	G, T2,T3	X

Geranium robertianum	herb Robert	T2	X
*Geum aleppicum**	yellow avens*	T3	N
Geum canadense	white avens	M1, T2,T3	N
Geum urbanum	urban avens	T2,T3	X
Glechoma hederacea	creeping Charlie	T3	X
*Glyceria grandis**	tall manna grass*	T2,T3	N
*Glyceria striata**	fowl manna grass*	M1, T2,T3	N
*Gymnocarpium dryopteris**	oak fern*	M1, T1,T2,T3	N
Hackelia virginiana	Virginia stickseed	M1, T3	LU
Hamamelis virginiana	witch-hazel	M1, G, T1,T2	LR
Hemerocallis fulva	orange day-lily	T2,T3	X
Hesperis matronalis	dame's rocket	M1, G, T3	X
Hieracium aurantiacum	orange hawkweed	T2	X
Hieracium caespitosum	yellow hawkweed	M1, T2,T3	X
Hieracium piloselloides	smooth yellow hawkweed	T3	X
Hordeum jubatum	foxtail barley	G	X
Hydrophyllum virginianum	Virginia waterleaf	T2,T3	N
Hygrocybe miniata	vermilion waxcup	G	N
*Hydrocotyle americana**	marsh pennywort*	M1,T3	LU*
Hypericum perforatum	St. John's wort	G, T2,T3	N
*Impatiens capensis**	spotted jewelweed *	M1, G, T2,T3	N
Inula helenium	elecampane	M1, T2	X
Juglans cinerea	butternut	T2, T3	PE
*Juglans nigra**	black walnut *	G, T2,T3	N
*Juncus bufonius**	toad rush*	T3	N
*Juncus dudleyi**	Dudley's rush*	T2,T3	N
*Juncus effusus**	soft rush*	T3	N
Juncus tenuis	path rush	T2,T3	N
Lactuca serriola	prickly lettuce	T2,T3	X
Lathyrus sylvestris	narrow-leaved everlasting pea	T3	X
Lathyrus tuberosus	tuberous vetchling	T3	X
Leucanthemum vulgare	oxeye daisy	M1, G,T2, T3	X
*Lemna minor**	common duckweed*	M1,M2, T2	N
*Lemna triscula**	star duckweed*	T2	LU*
*Lemna turionifera**	turion duckweed*	T3	N
Lepidium campestre	field pepper-grass	T2,T3	X
*Laportea canadensis**	wood nettle*	M1, T2,T3	N
*Leersia oryzoides**	cut grass*	M1, T2,T3	N
*Lemna turionifera**	turion duckweed*	T2	N
Leonurus cardiaca	motherwort	T2,T3	X
*Linaria vulgaris**	yellow toadflax *	G, T3	X
Lobelia inflata	Indian tobacco	M1, T2	N
Lolium perenne	perennial rye	M1, T3	X

Lolium pratense	meadow fescue	T2,T3	X
Lonicera canadensis	fly honeysuckle	G, T3	N
Lonicera dioica	wild honeysuckle	T2,T3	N
Lonicera morrowii	Morrow's honeysuckle	T2,T3	X
Lonicera tatarica	Tartarian honeysuckle	T2,T3	X
Lonicera Xbella	Bell's honeysuckle	T2,T3	X
*Lotus corniculatus**	birdsfoot trefoil *	G,M2, T2,T3	X
*Lycopus americanus**	cut-leaved water-horehound*	T2,T3	N
*Lycopus europaeus**	European water-horehound*	T3	X
*Lycopus uniflorus**	northern bugleweed*	M1,M2, T2	N
*Lysimachia nummularia**	moneywort*	T2,T3	X
*Lythrum salicaria**	purple-loosestrife*	M1, G, T2,T3	X
*Maianthemum canadense**	Canada mayflower *	M1, G, T2,T3	N
*Maianthemum racemosum**	false Solomon's seal *	M1, G, T2,T3	N
Malus pumila	apple	M1, G, T2,T3	X
Matricaria discoidea	pineappleweed	G	X
*Mattuccia struthiopteris**	ostrich fern*	M1,M2, T2,T3	N
Medeola virginianum	indian cucumber-root	T2,T3	LU
Medicago lupulina	black medick	T2,T3	X
Medicago sativa ssp. *falcata*	yellow alfalfa	T3	X
Medicago sativa ssp. *sativa*	alfalfa	T3	X
Melilotus albus	white sweet clover	M1, T2,T3	X
Melilotus officinalis	yellow sweet clover	T2	X
*Mentha canadensis**	wild mint*	T2	N
*Mentha spicata**	spearmint*	T2	X
Mentha Xpiperita	peppermint	M1	X
*Mitella diphylla**	mitrewort*	M1, T2,T3	N
*Mitella nuda**	naked mitrewort*	M1, T1,T2,T3	N
Moehringia lateriflora	grove stitchwort	T2	LR
*Monarda fistulosa**	wild bergamot *	M1, G, T2,T3	N
Monotropa hypopithys	pinesap	T2,T3	LU
Monotropa uniflora	indian pipe	G, T1,T3	N
Muhlenbergia mexicana	common muhly grass	M1, T2,T3	N
*Myosotis laxa**	smaller forget-me-not*	M1, T2	N
*Myosotis scorpioides**	large forget-me-not*	T2,T3	X
Myosotis sylvatica	woodland forget-me-not	T2	X
*Myosoton aquaticum**	giant chickweed*	T2,T3	X
*Najas flexilis**	bushy naiad*	T3	LU*
*Nasturtium microphyllum**	small-leaved watercress*	M1, T2,T3	X
*Nymphaea odorata**	white water lily *	G	LR*
*Onoclea sensibilis**	sensitive fern *	M1, G, T3	N
Oenothera biennis	common evening-primrose	M1, T2,T3	N
Oenothera parviflora	smaller evening-primrose	T3	N

*Osmunda cinnamomea**	cinnamon fern*	T3	N
Osmorhiza claytonii	sweet cicely	T1	N
Oryzopsis asperifolia	mountain rice-grass	M1, T1,T2,T3	N
*Ostrya virginiana**	ironwood *	M1, G, T2,T3	N
Oxalis stricta	common yellow wood-sorrel	T2,T3	X
Panicum capillare	panic grass	T3	N
Parthenocissus vitacea	Virginia creeper	M1, G, T2,T3	N
Persicaria hydropiper	water-pepper	T3	X
Persicaria maculosa	lady's thumb	T3	X
*Phalaris arundinacea**	reed canary grass *	M1,M2,G,T2,T3	N
Phegopteris connectilis	northern beech fern	T2	LR
Phleum pratense	Timothy-grass	M1, G, T2,T3	X
*Phragmites australis ssp. australis**	European common reed *	G, T2,T3	X
*Pilea fontana**	spring clearweed*	M1, T2,T3	LU*
*Pilea pumila**	dwarf clearweed*	M1, T2,T3	N
Phryma leptostachya	lopseed	M1, T2,T3	N
Physalis heterophylla	clammy ground-cherry	T3	LU
Picea abies	Norway spruce	T2,T3	P
*Picea glauca**	white spruce*	T2	P
*Picea mariana**	black spruce*	T2	P
Picris hieracioides	hawkweed oxtongue	T2	X
Pinus resinosa	red pine	M1, T2,T3	P
Pinus sylvestris	Scots pine	T2,T3	N
*Pinus strobus**	white pine *	m1, G, T3	N
Plantago lanceolata	English plantain	T2,T3	X
Plantago major	common plantain	T3	X
Plantago rugelii	red-stemmed plantain	T2,T3	N
Poa compressa	flat-stemmed blue grass	M1, T2,T3	X
Poa nemoralis	woodland spear grass	T2,T3	X
*Poa palustris**	fowl meadow-grass*	M1,M2, T2,T3	N
Poa pratensis	Kentucky blue grass	T2,T3	X
*Podophyllum peltatum**	mayapple *	G, T2,T3	N
Polygala paucifolia	fringed polygala	T1	LU
Polygonum achoreum	striate knotweed	T3	X
Polypodium virginianum	rock polypody	T1	LU
Polystichum acrostichoides	Christmas fern	M1, G, T1,T2,T3	N
Polygonatum pubescens	downy solomon's-seal	M1, T2,T3	N
*Populus alba**	white poplar *	G, T2,T3	X
*Populus balsamifera**	balsam poplar*	M1,M2, T2,T3	N
Populus deltoides	eastern cottonwood	G, T2,T3	N
*Populus grandidentata**	large-tooth aspen *	M1, G, T2,T3	N
*Populus tremuloides**	trembling aspen *	M1,M2,G,T2,T3	N
Populus Xheimburgeri	Heimburger's poplar	T3	X

Populus Xrouleauiana	Rouleau's poplar	T3	X
*Potamogeton crispus**	curly pondweed*	T3	N
*Potamogeton foliosus**	leafy pondweed*	T3	LU*
Potentilla norvegica	rough cinquefoil	T2	X
Potentilla recta	sulphur cinquefoil	T2,T3	X
Prenanthes alba	white wood lettuce	M1, T2	LU
Prenanthes altissima	tall wood lettuce	M1, T2,T3	N
Prunella vulgaris ssp. *lanceolata*	heal-all	T2,T3	N
Prunus avium	mazzard cherry	T2,T3	X
Prunus nigra	Canada plum	T3	LR
*Prunus serotina**	black cherry *	M1, G,T2,T3	N
*Prunus virginiana**	chokecherry *	M1, G,T2,T3	N
*Pteridium aquilinum**	bracken fern *	M1, G,T2,T3	N
Pyrola elliptica	shinleaf pyrola	T1,T2,T3	N
Quercus alba	white oak	G, T3	LU
*Quercus rubra**	red oak *	M1, G, T2,T3	N
Ranunculus abortivus	kidney-leaved buttercup	M1, T2,T3	N
Ranunculus acris	tall buttercup	M1, T2,T3	X
*Ranunculus hispidus var. caricetorum**	swamp buttercup*	T2,T3	N
Ranunculus recurvatus	hooked buttercup	T2,T3	N
*Ranunculus sceleratus**	cursed crowfoot*	T2,T3	N
Reynoutria japonica var. *japonica*	Japanese knotweed	T2,T3	X
*Rhamnus cathartica**	common buckthorn*	M1,M2,G,T2,T3	X
*Rhus typhina**	staghorn sumac *	M1, G, T2,T3	N
*Ribes americanum**	wild black currant*	M1, T2,T3	N
Ribes cynosbati	prickly gooseberry	M1, T2,T3	N
Ribes rubrum	garden red currant	T2,T3	X
*Ribes triste**	swamp red currant	T2	N
*Robinia pseudoacacia**	black locust *	M1, G, T2,T3	N
Rorippa palustris ssp. *palustris**	Fernald's marsh cress*	T2	N
Rosa blanda	smooth wild rose	T2,T3	N
Rosa multiflora	multiflora rose	T2,T3	X
Rubus alleghaniensis	common blackberry	M1, T2,T3	N
Rubus idaeus	red raspberry	M1, G, T2,T3	N
*Rubus occidentalis**	black raspberry *	M1, G,T2,T3	N
Rubus odoratus	purple-flowering raspberry	M1, T2,T3	N
*Rubus pubescens**	dwarf raspberry*	M1, T2,T3	N
Rudbeckia hirta	black-eyed Susan	M1, T2,T3	N
*Rudbeckia triloba**	brown-eyed Susan *	G	X
Rumex crispus	curly dock	G,T2,T3	X
*Sagittaria latifolia**	common arrowhead*	T2,T3	N
*Salix alba**	white willow*	T2,T3	X
*Salix amygdaloides**	peach-leaved willow*	M2, T2,T3	N

*Salix bebbiana**	bebb's willow *	M1, G, T2,T3	N
*Salix discolor**	pussy willow*	M1, T2,T3	N
*Salix eriocephala**	missouri willow*	M2, T2,T3	N
*Salix exigua**	interior willow*	M2, T3	N
*Salix fragilis**	crack willow *	G,T3	X
*Salix petiolaris**	slender willow *	G	N
Salix x *sepulcralis**	weeping willow*	T3	X
*Sambucus canadensis**	common elderberry*	T2,T3	N
Sambucus racemosa	red elderberry	M1, G, T2,T3	N
Sanguinaria canadensis	bloodroot *	G, T2,T3	N
*Schoenoplectus tabernaemontani**	soft-stemmed bulrush*	T2,T3	N
*Scirpus atrovirens**	black-fruited bulrush*	T2,T3	N
*Scirpus cyperinus**	woolly bulrush*	T3	N
*Scirpus microcarpus**	barber-pole bulrush*	T2	N
*Scutellaria lateriflora**	mad-dog skullcap*	T3	N
Securigera varia	crown vetch	T3	X
Setaria pumila	yellow foxtail	T3	X
Setaria viridis	green foxtail	T3	X
Silene latifolia	evening lychnis	T2	X
Silene vulgaris	bladder campion	T2	X
Sinapis arvensis	charlock	T3	X
Smilax herbacea	carrion-flower	T3	N
*Solanum dulcamara**	bittersweet nightshade *	M1, G, T2,T3	N
*Solidago altissima**	tall goldenrod *	M1, G, T2,T3	N
*Solidago canadensis**	Canada goldenrod *	M1, G, T2	N
Solidago caesia	blue-stemmed goldenrod	M1, T2,T3	N
Solidago flexicaulis	zig-zag goldenrod	M1, T2,T3	N
*Solidago gigantea**	late goldenrod*	T2,T3	N
Solidago juncea	early goldenrod	T2,T3	N
Solidago nemoralis	grey goldenrod	T2,T3	N
*Solidago patula**	rough-leaved goldenrod*	T3	LR*
*Solidago rugosa**	rough-stemmed goldenrod*	M1, T2,T3	N
Sonchus arvensis ssp. *arvensis*	glandular perennial sow-thistle	T2,T3	X
Sonchus oleraceus	annual sow-thistle	T2	X
Sorbaria sorbifolia	false spiraea	T2	X
Sorbus aucuparia	European mountain-ash	M1, T2,T3	X
*Sphagnum sp.**	sphagnum moss sp.*	G	N
Spiraea alba	narrow-leaved meadowsweet	T1,T3	N
*Spirodela polyrhiza**	greater duckweed*	T3	LU*
*Stellaria longifolia**	long-leaved stitchwort*	T2	LR*
*Streptopus lancoelatus**	rose twisted-stalk*	M1, T1,T3	N
*Stuckenia pectinata**	sago pondweed*	G, T3	LU*
Symphoricarpus albus var. *albus*	snowberry	M1	LU

Symphyotrichum cordifolium	heart-leaved aster	M1, T2,T3	N
Symphyotrichum ericoides	heath aster	T2,T3	N
Symphyotrichum laevis	smooth aster	T2	LR
*Symphyotrichum lancoelatum**	panicled aster*	M2, T3	N
*Symphyotrichum lateriflorum**	calico aster*	M1, T2	N
*Symphyotrichum novae-angliae**	New England aster*	M1, M2, T3	N
*Symphyotrichum puniceum**	swamp aster*	M1, T2,T3	N
Symphyotrichum Xamethystinum	amethyst aster	T2,T3	N
Syringa vulgaris	common lilac	T2,T3	X
*Tanacetum vulgare**	tansy *	G	X
Taraxacum officinale	comon dandeliion	M1, T2,T3	X
Taxus canadensis	Canada yew	M1	N
Thalictrum dioicum	early meadowrue	M1, G, T3	N
*Thalictrum pubescens**	tall meadow rue*	T2,T3	N
Thlaspi arvense	penny-cress	T3	X
Thelypteris noveboracensis	New York fern	T3	LR
*Thelypteris palustris**	marsh fern*	T2,T3	N
Thuja occidentalis	easter white cedar *	M1,M2, G, T3	N
*Tiarella cordifolia**	foam-flower*	M1, T2,T3	N
*Tilia americana**	american basswood*	M1, T2,T3	N
*Toxicodendron rydbergii**	poison ivy *	M1, G, T2	N
Tragopogon dubius	lemon-yellow goat's beard	T3	X
Tragopogon pratense	meadow goat's-beard	G, T3	X
Tripleurospermum inodorum	scentless chamomile	T2,T3	X
*Trientalis borealis**	starflower*	T1,T3	N
Trifolium hybridum	alsike clover	G, T2,T3	X
Trifolium pratense	red clover	T2,T3	X
*Trifolium repens**	white clover *	G, T2,T3	X
*Trillium erectum**	red trillium*	M1, T1,T2,T3	N
*Trillium grandiflorum**	white trillium *	M1, G, T2,T3	N
Tsuga canadensis	eastern hemlock *	M1, G, T2,T3	N
Tussilago farfara	coltsfoot	M1, G, T2,T3	X
*Typha angustifolia**	narrow-leaved cattail *	M1, G, T2,T3	N
*Typha latifola**	common cattail*	M1,M2, T2,T3	N
*Typha Xglauca**	hybrid cattail*	T3	N
*Ulmus americana**	white elm*	M1,M2, T2,T3	N
Ulmus glabra	Scotch elm	T2,T3	X
Ulmus pumila	Siberian elm	G	X
*Urtica dioica ssp. gracilis**	American stinging nettle*	M2, T2,T3	N
Uvularia grandiflora	large-flowered bellwort	M1, T1,T2	N
Valeriana officinalis	valerian	G, T2	X
Verbascum thapsus	great mullein	G, T2,T3	X
*Verbena urticifolia**	white vervain*	T2	N

*Veronica americana**	American speedwell*	M1, T2,T3	LU*
Veronica officinalis	common speedwell	M1, T2,T3	X
Veronica serpyllifolia	thyme-leaved speedwell	T2	X
Veronica verna	spring speedwell	T2	X
Viburnum acerifolium	maple-leaved viburnum	M1, G, T2	N
Viburnum lantana	wayfaring tree	M1, T2,T3	X
Viburnum opulus	European highbush cranberry	M1, T2,T3	X
Vicia cracca	cow vetch	M1, G, T2,T3	X
Vicia tetrasperma	slender vetch	T3	X
Vinca minor	common periwinkle	T2,T3	X
Vinceotoxicum rossicum	dog-strangling vine	T2,T3	X
Viola arvensis	field pansy	T2	X
*Viola blanda**	sweet white violet*	M1	N
*Viola cucullata**	marsh blue violet*	T2	N
Viola labradorica	dog violet	T2,T3	N
*Viola macloskeyi**	northern white violet*	T3	LU*
Viola odorata	sweet violet	T3	X
Viola pubescens var. *pubescens*	downy yellow violet	M1, T2,T3	N
*Viola sororia**	common blue violet*	M1, T2,T3	N
Viola rostrata	long-spurred violet	T1	N
*Vitis riparia**	riverbank grape *	M1, G, T2,T3	N
*Xanthium strumarium**	cocklebur*	T3	N

Fauna in and around the East Don River Headwater Wetland Complex

Legend: **Observers**: **M**- June 14, 2017 observations of Steve Varga, Thivyah Siva & Austeja Vaskeviciute (OMNRF Aurora District) & Kim Logan (GEM Services Inc.) & July 18, 2018 observations of Steve Varga, Melanie Shapiera & Lauren Moretto (OMNRF, Aurora District), Timothy Law (Ontario Streams) & Kim Logan (GEM Services Inc.); **G**- Erin Donkers, Matthew Colucci, Joelle Pecora & Kim Logan (GEM Services Inc.) 2017, 2018 & 2019 observations; **T1**- Mike King & Gavin Miller (TRCA) 2009 observations; **T2**- Paul Prior (TRCA) 2001 & 2002 observations; **T3**-Gavin Miller, Dell Tune & Sue Hayes (TRCA) 2015 observations; **Status**: PT- provinically threatened, **PS** provincially significant species tracked by the Natural Heritage Information Centre, Breeding Bird Status: B- breeding bird, C- confirmed breeder, p- probable breeder, o- possible breeder, v-summer visitor, *****- fauna marked with an asterisk occur in the wetland complex, +- fauna marked with a plus sign no longer occur in the wetland complex

Latin Name	Common Name	Observer	Status
Accipiter striatus	Sharp-shinned Hawk *	T2	B
Agelaius phoeniceus	Red-winged Blackbird *	G	B
Amphipoda sp.	scuds *	G	
Anas platyrhynchos	Mallard *	G	B
Anaxyrus americanus	American Toad *	T1, T3	
Anisoptera sp.	dragonfly *	G	
Ardea herodias	Great Blue Heron *	G	v
Buteo jamaicensis	Red Tailed Hawk	G	B
Cardinalis cardinalis	Cardinal	G	B
Catharus fuscescens	Veery *	T2	B
Certhia americania	Brown Creeper *	T1, T2, T3	B, p
Ceryle alcyon	Belted Kingfisher *	T1	B, o
Charadrius vociferus	Killdeer*	G	B
Chelydra serpentina	Common Snapping Turtle +	T3	PS+
Chironomidae sp.	midges *	G	
Chrysemys picta marginata	Midland Painted Turtle *	G, T3	PS
Colaptes auratus	Northern Flicker	T1	B, p
Coleoptera sp.	beetles *	G	
Contopus virens	Eastern Wood-pewee *	M, G, T1,T2	PS, B, p
Corvus corax	Raven	G	B
Cyanocitta cristata	Blue Jay	G	B
Danaus plexippus	Monarch Butterfly *	G	
Dolichonyx oryzivorus	Bobolink	G, T2	B
Dryocopus pileatus	Pileated Woodpecker *	G, T1	B, p
Dumetella carolinensis	Grey Catbird *	G, T3	B, p
Empidonax traillii	Wilow Flycatcher *	G	B
Ephemeroptera sp.	mayfly *	G	
Geothlypis trichas	Common Yellowthroat *	G	B, o
Gerridae sp.	water striders *	G	
Haemorhous mexicanus	House Finch *	G	B

Hemiptera sp.	true bugs *	G	
Hirundo rustica	Barn Swallow *	G	PT, B, p
Hyla versicolor	Gray Treefrog *	G, T3	
Hylocichla mustelina	Wood Thrush *	T1	PS, B, p
Icterus galbula	Northern Oriole *	G	B
Icterus galbula	Baltimore Oriole *	G	B
Limenitis arthemis	White Admiral *	G	
Lithobates clamitans	Green Frog *	G, T1, T3	
Lithobates pipiens	Northern Leopard Frog *	T1	
Lithobates sylvaticus	Wood Frog *	G, T1, T3	B, p
Lophodytes cucullatus	Hooded Merganser*	T3	B, C+
Lymnaea stagnalis	Pond Snails *	G	
Melanerpes carolinus	Red-bellied Woodpecker*	T3	B, o
Meleagris gallopavo	Wild Turkey *	G, T1	B, C
Melospiza georgiana	Swamp Sparrow*	T3	B, p
Melospiza melodia	Song Sparrow *	G	B
Mimus polyglottos	Northern Mockingbird	G	B
Molothrus ater	Brown Headed Cowbird *	G	B
Myiarchus crinitus	Great Crested Flycatcher *	T1, T3	B, p
Notonectidae sp.	backswimmer *	G	
Odocoileus virginianus	White-tailed Deer *	T1, T2	
Passer montanus	Tree Sparrow *	G	B
Passerculus sandwichensis	Savannah Sparrow	G	B
Passerina cyanea	Indigo Bunting *	G, T1, T3	B, p
Picoides villosus	Hairy Woodpecker *	T1	B, o
Piranga olivacea	Scarlet Tanager *	T1, T2, T3	B, o
Pisidium moitessierianum	Fingernail Clams *	G	
Plethodon cinereus	Eastern Red-backed Salamander	T3	
Podilymbus podiceps	Pied-billed Grebe *	G	B
Poecile atricapillus	Black Capped Chickadee *	G	B
Pseudacris crucifer	Spring Peeper *	G, T3	
Quiscalus quiscula	Common Grackle *	G	B
Sciuridae sp.	Black/Grey Squirrel	G	
Scolopax minor	American Woodcock *	G, T2	B
Seiurus aurocapillus	Ovenbird *	T2	B
Setophaga americana	Northern Parula *	G	B
Setophaga pinus	Pine Warbler *	T1, T2	B. p
Setophaga ruticilla	American Redstart *	T2	B
Setophaga virens	Black-throated Green Warbler*	T2	B
Sitta canadensis	Red-breasted Nuthatch*	T1	B, o
Sitta carolinensis	White-breasted Nuthatch	T1	B, C
Sphyrapicus varius	Yellow-bellied Sapsucker	G	B
Spinus tristis	American Goldfinch *	G	B

Spizella pallida	Clay Coloured Sparrow *	G	B
Storeria occipitomaculata	Red-bellied Snake *	T1	
Sturnella magna	Eastern Meadowlark *	G	B
Sturnus vulgaris	European Starling *	G	B
Tachycineta bicolor	Tree Swallow *	G	B
Tamias striatus	Eastern Chipmunk *	T1	
Tetranychus urticae	red mites *	G	
Thamnophis sirtalis sirtalis	Eastern Gartersnake *	G	
Toxostoma rufum	Brown Thrasher*	G	B
Turdus migratorius	American Robin *	G	B
Tyrannus tyrannus	Eastern Kingbird *	G, T3	B, p
Vireo olivaceus	Red-eyed Vireo *	T1, T3	B, p
Zygoptera sp.	damselfly *	G	

WETLAND EVALUATION SCORING RECORD

Wetland Name: East Don River Headwater Wetland Complex

1.0 BIOLOGICAL COMPONENT

1.1 PRODUCTIVITY

16	1.1.1	Growing Degree-Days/Soils
9	1.1.2	Wetland Type
2	1.1.3	Site Type

1.2 BIODIVERSITY

13	1.2.1	Number of Wetland Types
27	1.2.2	Vegetation Communities
7	1.2.3	Diversity of Surrounding Habitat
2	1.2.4	Proximinty to Other Wetlands
12	1.2.5	Interspersion
8	1.2.6	Open Water Type

9	1.3	SIZE (Biological Component)
105		Subtotal
105		TOTAL (Biological Component)

2.0 SOCIAL COMPONENT

2.1 ECONOMICALLY VALUABLE PRODUCTS

0	2.1.1 Wood Products
0	2.1.2 Wild Rice
0	2.1.3 Commerical Fish (Bait Fish and/or Coarse Fish)
0	2.1.4 Furbearers

40	2.2 RECREATIONAL ACTIVITIES

2.3 LANDSCAPE AESTHETICS

0	2.3.1 Distinctness
4	2.3.2 Absence of Human Disturbance

2.4 EDUCATION AND PUBLIC AWARENESS

0	2.4.1 Educational Uses
4	2.4.2 Facilities and Programs
5	2.4.3 Research and Studies

40	2.5 PROXIMITY TO AREAS OF HUMAN SETTLEMENT
8	2.6 OWNERSH1P
16	2.7 SIZE (Social Component)
0	2.8 ABORIGINAL AND CULTURAL VALUES

2.8.1 Aboriginal Values
2.8.2 Cultural Heritage

117	Subtotal
117	TOTAL (Social Component)

3.0 HYDROLOGICAL COMPONENT

67	3.1 FLOOD ATTENUATION
	3.2 WATER QUALITY IMPROVEMENT
26	3.2.1 Short Term Water Quality Improvement
10	3.2.2 Long Term Nutrient Trap
24	3.2.3 Groundwater Discharge
0	3.3 CARBON SINK
15	3.4 SHORELINE EROSION CONTROL
	3.5 GROUNDWATER RECHARGE
49	3.5.1 Site Type
7	3.5.2 Soils
198	Subtotal
198	TOTAL (Hydrological Component)

4.0 SPECIAL FEATURES COMPONENT

4.1 RARITY

4.1.1 Wetland Types

60	4.1.1.1	Rarity within the Landscape
10	4.1.1.2	Rarirty of Wetland Type

4.1.2 Species

250	4.1.2.1	Reproductive Habitat for an Endangered or Threatened Species
150	4.1.2.2	Traditional Migration or Feeding Habitat for an Endangered or Threatened Species
95	4.1.2.3	Provincially Significant Animal Species
0	4.1.2.4	Provincially Significant Plant Species
0	4.1.2.5	Regionally Significant Species
38	4.1.2.6	Locally Significant Species

4.2 SIGNIFICANT FEATURES OR HABITATS

0	4.2.1	Colonial Waterbirds
10	4.2.2	Winter Cover for Wildlife
10	4.2.3	Waterfowl Staging and/or Moulting Areas
10	4.2.4	Waterfowl Breeding
10	4.2.5	Migratory Passerine, Shorebird or Raptor Stopover Area
	4.2.6	Fish Habitat
15	4.2.6.1	Spawning and Nursery Habitat
10	4.2.6.2	Migration and Staging Habitat

3	4.3 ECOSYSTEM AGE
0	4.4 GREAT LAKES COASTAL WETLANDS
671	Subtotal
250	TOTAL (Special Features Component)

SUMMARY OF EVALUATION RESULT

105	1.0	TOTAL FOR BIOLOGICAL COMPONENT
117	2.0	TOTAL FOR SOCIAL COMPONENT
198	3.0	TOTAL FOR HYDROLOGICAL COMPONENT
250	4.0	TOTAL FOR SPECIAL FEATURES COMPONENT
670		TOTAL WETLAND SCORE

FOR OMNRF USE ONLY

OMNRF Reviewer (Name & Position)	Steve Varga, District Management Biologist, OMNRF Aurora District
Reviewer Comments	
OMNRF Approver (Name & Position)	Joad Durst, Resources Management Supervisor, OMNRF Aurora District
Approval Date	December, 2019

APPENDIX B – Photographic Record

Photo 1: Fisheries Site 1 - Dam outfall and fish passage barrier at upstream edge of survey area

Photo 2: Fisheries Site 1 - Abundant woody debris and riparian vegetation within the wooded reach of the channel

Photo 3: Fisheries Site 1 - Abundant sediment within the reach

Photo 4: Fisheries Site 1 - Dense riparian vegetation

Photo 5: Fisheries Site 1 - Marsh habitat at downstream end of survey area

Photo 6: Fisheries Site 1 - Iron staining and evidence of groundwater seeps

Photo 7: Fisheries Site 1 - Blacknose Dace captured downstream of the dam

Photo 8: Fisheries Site 2 - Upstream of Teston Road showing the vegetated channel leading to the culvert

Photo 9: Fisheries Site 2 - Small shallow channel through dense vegetation upstream of Teston Road

Photo 10: Fisheries Site 2 - Dense Phragmites at culvert inlet upstream of Teston Road

Photo 11: Fisheries Site 2 - Culvert outlet downstream of Teston Road

Photo 12: Fisheries Site 2 - Channel reach downstream of Teston Road

Photo 13: Fisheries Site 2 - Soft sediment and still water downstream of Teston Road

Photo 14: Fisheries Site 2 - Pedestrian bridge on private property with blocked CSP culverts

Photo 15: Fisheries Site 3 - Sediment fences flanking the culvert inlet and channel within the right-of-way

Photo 16: Fisheries Site 3 - Culvert inlet and headwall upstream of Teston Road

Photo 17: Fisheries Site 3 - Dry cobble channel and landscape fabric upstream of the culvert inlet

Photo 18: Fisheries Site 3 - Dry channel upstream of the right-of-way

Photo 19: View of Eastern Garter Snake observed within Dry-Fresh Hardwood – Hemlock Mixed Forest (FOM3-1) community within the Technically Preferred Alternative limits

Photo 20: View of Raccoons observed within Fresh-Moist Hemlock – White Pine Coniferous Forest (FOC3-A) community within the Technically Preferred Alternative limits

Photo 21: View of White-tailed Deer tracks observed on gravel road within the Native Forb Meadow (CUM1-A) community within the Technically Preferred Alternative limits

Photo 22: View of Raccoon tracks observed within the Jewelweed Mineral Meadow Marsh (MAM2-9) community within the Technically Preferred Alternative limits

Photo 23: View of Midland Painted Turtle hatchling observed in proximity to the Technically Preferred Alternative limits adjacent to a Duckweed Floating-leaved Shallow Aquatic (SAF1- 3) community, north and west of Dufferin Street

Photo 24: View of an American Toad observed in forest tract along East Don River, west of Dufferin Street and north of the Technically Preferred Alternative

Photo 25: View of Native Forb Meadow (CUM1-A) community providing habitat for Threatened Eastern Meadowlark and Bobolink, north of Teston Road near Rodinea Road, in Vaughan Landfill site

Photo 26: View of Duckweed Floating-leaved Shallow Aquatic (SAF1-3) community at BBS 10 where a Snapping Turtle (Special Concern) was observed basking, north of Technically Preferred Alternative limits

Photo 27: View of Deer trails within Native Forb Meadow (CUM1-A) community east of Keele Street, in proximity to Technically Preferred Alternative limits

Photo 28: View of Deer beds within Native Forb Meadow (CUM1-A) community east of Keele Street, in proximity to Technically Preferred Alternative limits

Photo 29: View of Dry-Fresh Hardwood – Hemlock Mixed Forest (FOM3-1) community, extending into Technically Preferred Alternative limits

Photo 30: View of White Cedar - Conifer Mineral Coniferous Swamp (SWC1-2) community, extending into Technically Preferred Alternative limits

Photo 31: View of Fresh-Moist Hemlock Coniferous Forest (FOC3-1) and Jewelweed Mineral Meadow Marsh (MAM2-9) communities, within Technically Preferred Alternative limits

Photo 32: View Duckweed Floating-leaved Shallow Aquatic (SAF1- 3) and Jewelweed Mineral Meadow Marsh (MAM2-9) communities, extending into Technically Preferred Alternative limits