



# Environmental Impact Study

200 John St. & 588 Charlotte St.

JULY 2020



# Environmental Impact study

200 John St. & 588 Charlotte St,

Niagara-on-the-Lake, ON

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## 1.0 INTRODUCTION

Savanta Inc. (Savanta) was retained by Solmar (Niagara 2) Inc. (Solmar) to complete a Scoped Environmental Impact Study (EIS) for a proposed residential subdivision on their lands at 200 John Street and 588 Charlotte Street (herein referred to as the Subject Lands), within the Town of Niagara-on-the-Lake, Ontario (**Figure 1, Appendix A**). The Subject Lands are generally bound by private residential properties to the north, east and west and a winery/vineyard to the south and will have road access from John Street and emergency access from Charlotte Street. The Subject Lands are legally described as Lots 145 and 156, Registrar's Compiled Plan 692 and Lot 14, Plan M-11, Town of Niagara-on-the-Lake, Regional Municipality of Niagara.

The Subject Lands are predominantly located within the Town of Niagara-on-the-Lake Urban Area boundary, although a portion is located outside the Urban Area. They are also located within the Greenbelt planning area; the portion within the Urban Area boundary is a Settlement Area under the Greenbelt Plan, while the remainder of the Subject Lands are located within the Protected Countryside, as shown on **Figure 2 (Appendix A)**, which is also designated part of the Niagara Peninsula Tender Fruit and Grape Area under the Greenbelt Plan. The proposed subdivision will be restricted to the portion of the Subject Lands located within the Urban Area. The portion of the Subject Lands within the Protected Countryside/Niagara Peninsula Tender Fruit and Grape Area is identified as part of the Greenbelt Natural Heritage System.

The two properties have previously been used for residential purposes, but both are currently vacant with residual residential buildings and associated open space, including areas identified as Environmental Protection Area and Environmental Conservation Area in the Regional Municipality of Niagara Official Plan Core Natural Heritage Map (Niagara Region 2015).

### 1.1 Purpose of the Report

An EIS is required to assess the potential impacts of the proposed development on the natural heritage features and associated functions on the Subject Lands, based on the presence of Environmental Protection Area, Environmental Conservation Area and the Greenbelt Natural Heritage System on and adjacent to the Subject Lands.

This work considers applicable provincial and municipal requirements and policies including reference to the natural heritage policies of the Province of Ontario's Provincial Policy Statement (PPS; MMAH 2020), associated provincial implementation guidance contained in the Natural Heritage Reference Manual (NHRM; MNR 2010).

The study components included:

- A review of existing natural heritage background information, policies and legislation applicable to the Subject Lands in its regional context;
- A field review of the natural heritage features on and immediately adjacent to the Subject Lands through the completion of various ecological surveys and inventories;
- An evaluation of the sensitivity of the natural heritage features and their functions on the Subject Lands;
- An assessment of whether any of the existing natural heritage features within the Subject Lands meet the test of 'significance' as identified by the PPS;
- A description of the proposed undertaking and development proposal;
- Identification and discussion of the potential impacts that could occur to the natural heritage features as a result of the proposed development;
- Recommendations for mitigation to avoid or minimize impacts; and
- Opportunities for the enhancement or restoration of natural features.

## 1.2 Scope of the EIS

Savanta prepared a Terms of Reference for the Scoped EIS (Savanta 2018), based on the Regional Municipality of Niagara's Environmental Impact Study Guidelines (2018) and provided it to the Region for Review. The Region retained a third party to review and provide comment on the Terms of Reference. The Terms of Reference and the third-party review comments are provided in **Appendix C**. This Scoped EIS has been prepared in accordance with the Terms of Reference and review comments provided by the Regional Municipality of Niagara.

## 2.0 NATURAL HERITAGE PLANNING CONSIDERATIONS

An assessment of the quality and extent of natural heritage features found on, and adjacent to, the Subject Lands and the potential impacts to these features from the proposed development application was completed to address the natural heritage components of the following regulatory agencies, local and regional municipalities, and/or legislation:

- Provincial Policy Statement (PPS) 2020;
- Regional Municipality of Niagara Official Plan (2014);
- Town of Niagara-on-the-Lake Official Plan (2017);
- Greenbelt Plan (MMAH 2017);
- NPCA policies (NPCA 2018a);
- Provincial *Endangered Species Act, 2007* (ESA);
- Federal *Fisheries Act*; and
- Federal *Migratory Birds Convention Act*.

The relevant portions of each of these, as they apply to the Subject Lands and the proposed development, are discussed in the following sections.

In October 2019, the Town adopted a new Official Plan. The new Official Plan has not been approved by the approval authority, the Regional Municipality of Niagara.

### 2.1 Provincial Policy Statement and Associated Guideline Documents

The PPS (MMAH 2020) provides direction on matters of provincial interest related to land use planning and development. It "...supports a comprehensive, integrated and long-term approach to planning..." The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

This report addresses those policies that are specific to Natural Heritage (section 2.1) with reference to other policies with relevance to Natural Heritage and impact assessment considerations and areas of overlap (e.g., those related to Efficient and Resilient Development and Land Use Patterns, section 1.1; Sewage, Water and Stormwater, section 1.6.6; Water, section 2.2; Natural Hazards, section 3.1).

Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Fish habitat;



- Habitat of endangered and threatened species; and
- Significant areas of natural and scientific interest (ANSIs).

The PPS indicates that development and site alteration shall not be permitted in significant wetlands or significant coastal wetlands. The PPS also indicates that development and site alteration shall not be permitted in significant woodlands, significant valleylands, significant wildlife habitat or significant ANSIs, unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

The PPS indicates that development and site alteration shall not be permitted in the habitat of endangered and threatened species or in fish habitat, except in accordance with provincial and federal requirements. Development and site alteration may be permitted on lands adjacent to significant natural heritage features (i.e., within 120 m of the Subject Lands, as identified in the Natural Heritage Reference Manual; MNR 2010) provided it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

## 2.2 Regional Municipality of Niagara Official Plan

The Region of Niagara Official Plan (consolidated version August 2015) identifies a Core Natural Heritage System (the Regional NHS), consisting of the following types of features:

- Environmental Protection Areas (EPA) or Environmental Conservation Areas (ECA);
- Potential Natural Heritage Corridors connecting the Core Natural Areas;
- Greenbelt Natural Heritage and Water Resource Systems; and
- Fish Habitat.

The Region's EPA designation includes:

- Provincially significant wetlands;
- Provincially significant life science Areas of Natural and Scientific Interest (ANSIs);
- Significant habitat of endangered and threatened species (not mapped by the Region; where identified, this habitat will be subject to EPA policies); and
- Greenbelt Natural Heritage System (wetlands, significant valleylands, significant woodlands, SWH, habitat of species of concern, publicly owned conservation lands savannahs, tallgrass prairies, alvars).

The Region's ECA designation includes:

- Significant woodlands, significant wildlife habitat, significant habitat of species of concern;
- Regionally significant life science ANSIs;
- Other evaluated wetlands;
- Significant valleylands;

- Savannahs, tallgrass prairie and alvars; and
- Publicly owned conservation lands.

Potential Natural Heritage Corridors include:

- Areas that maintain and, where possible, enhance the ecological functions of the corridor in linking the core natural areas.

Regional NHS policies (Chapter 7.B; Region 2015) that apply to Regional NHS elements on the Subject Lands are summarized below:

- Only minor adjustments to EPA boundaries will be permitted without amendment to the Regional Official Plan (Plan);
- Development and site alteration may be permitted without amendment to the Plan in ECAs and on adjacent land to EPA and ECAs outside the Greenbelt NHS if it has been demonstrated over the long term, that there will be no significant negative impact on the Regional NHS or adjacent lands and the proposed development or site alteration is not prohibited by other policies;
- Where it is demonstrated that all, or a portion of, an ECA does not meet the criteria for designation under this Plan, the restrictions on development and site alteration do not apply;
- Where development or site alteration is proposed in or near a potential natural heritage corridor (shown conceptually on Schedule C; Region 2015), development should be located, designed and constructed to maintain and where possible, enhance the ecological functions of the corridor in linking core natural areas or an alternative corridor should be developed;
- Development or site alteration within fish habitat may occur if it will result in no net loss of the productive capacity of fish habitat as determined by the Department of Fisheries and Oceans or its designate; and

Where development or site alteration is approved in or adjacent to the Regional NHS, new lots shall not extend into the area to be retained in a natural state as part of the NHS or the buffer zone identified through an EIS.

### **2.3 Town of Niagara-on-the-Lake Official Plan**

Schedule B (Land Use Plan) of the Town of Niagara-on-the-Lake Official Plan (2017) designates the Subject Lands as being within the Niagara/Old Town Urban Area and Community Improvement Area boundaries. Schedule B shows a part of the northern portion of the Subject Lands as being designated for Medium Density Residential, while the remainder of the lands within the Urban Area boundary are designated for Low Density Residential land use. The portions of the Subject Lands outside the Urban Area boundary are designated for Agricultural uses. No Conservation lands are depicted on or within 120 m of the main portion of the Subject Lands. However, the proposed road from John Street crosses

over the Conservation Lands associated with One Mile Creek.

Section 16 of the Town of Niagara-on-the-Lake Official Plan (Town of Niagara-on-the-Lake 2017) provides specific policies for lands that are “considered to be environmentally significant or where lands are considered unsuitable for buildings purposes and require special attention to avoid loss of life and property damage”. These policies apply to the following feature types:

- Provincially Significant Wetlands;
- Flood prone and shoreline erosion areas;
- ANSIs;
- Woodlots; and
- Fish habitat.

## 2.4 Greenbelt Plan

The Subject Lands are located within the Greenbelt Area. The Greenbelt Plan (MMAH 2017) works to permanently protect environmentally sensitive areas, due to their ecological value, within the Greenbelt Area. It is intended to enhance the natural landscapes by working to facilitate the connection of environmentally significant areas and reducing fragmentation of the landscape. Protection is also offered to permanent agricultural areas ensuring the permanency and sustainability of natural resources. One of the plan’s goals is “protection and restoration of natural and open space connections between the Oak Ridges Moraine, the Niagara Escarpment, Lake Ontario, Lake Simcoe and the major river valley lands”.

The Subject Lands are primarily located within an area identified as a Town/Village under the Greenbelt Plan. Lands to the east, north and west are also located within the Town/Village designation. Lands to the south are located within the Protected Countryside and specifically, the Greenbelt Natural Heritage System.

The natural heritage protection policies of the Greenbelt Plan (MMAH 2017) do not apply on the portion of the Subject Lands located within the Town/Village designation but do apply for the portion in the Natural Heritage System.

## 2.5 Niagara Peninsula Conservation Authority

NPCA administers the *Development, Interference with Wetlands, Alterations to Shorelines and Watercourses* Regulation, (O. Reg.) 155/06, which defines the areas of interest that allow NPCA to:

- Prohibit, regulate, or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland; and

- Prohibit, regulate, or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development.

NPCA implements its authority under O.Reg. 155/06 in accordance with the *NPCA Policy Document: Policies for the Administration of Ontario Regulation 155/06 and the Planning Act* (NPCA 2018a).

## 2.6 Ontario Endangered Species Act (ESA), 2007

The provincial ESA was developed to:

- Identify species at risk, based upon best available science;
- Protect species at risk and their habitats and to promote the recovery of species at risk; and
- Promote stewardship activities that would support those protection and recovery efforts.

The ESA species are legally protected from harm or harassment and their associated habitats are legally protected from damage or destruction, as defined under the ESA.

## 2.7 Federal Fisheries Act

The Department of Fisheries and Oceans Canada (DFO) administers the federal *Fisheries Act* which defines fish habitat as "*spawning grounds and other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes*" [subsection (2)1]. The *Fisheries Act* prohibits the death of fish by means other than fishing [subsection 34.4 (1)] and the harmful alteration, disruption or destruction of fish habitat [HADD; subsection 35. (1)]. A HADD is defined as "*any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes*" (DFO 2019a).

Some projects may be eligible for exemption from the DFO review process, as specified under Step 3 of the DFO Fish and Fish Habitat Protection Program review process (DFO 2019b; e.g., clear-span bridges and bridge maintenance projects where DFO mitigation measures are applied, artificial waterbodies with no hydrological connection to occupied fish habitat, and projects that follow the Standards and Codes of Practice defined by DFO). All other projects or activities that have the potential to impact fish or fish habitat should be submitted to DFO through the "Request for Review" process. DFO will review the proposed project to determine whether there is potential to (1) impact an aquatic species at risk, (2) cause the death of fish or (3) result in HADD of fish habitat. The death of fish by means other than fishing or a HADD of fish habitat can be authorized by DFO under paragraphs 34.4(2)(b) or 35(2)(b) of the *Fisheries Act*.

## 2.8 Federal Migratory Birds Convention Act

The federal *Migratory Birds Convention Act* protects most species of birds, and their nests, in Canada. Section 5 of the Act prohibits anyone from being in possession of a migratory bird or nest. Typically,

these prohibitions are applied to prohibit disruption of nesting activities of migratory birds, such as implementation of timing restrictions to ensure migratory birds and their young have left an area before it is disturbed due to construction or before trees are removed.

### 3.0 DATA COLLECTION APPROACH & METHODS

#### 3.1 Background References

The following resources were reviewed for information relating to natural features and species that may be found on the Subject Lands:

- Ministry of Natural Resources and Forestry (MNRF) Land Information Ontario (LIO) Natural Features Mapping;
- Natural Heritage Information Centre (NHIC) database;
- Online atlas data;
- DFO Aquatic Species at Risk Distribution Mapping (2018); and
- One Mile Creek Watershed Plan (NPCA 2005).

The results of the background review are discussed in the following sections. This information assisted in defining the search effort and target species for studies on and immediately adjacent to the Subject Lands.

##### 3.1.1 Land Information Ontario Natural Features Summary

Based on the Ministry of Natural Resources and Forestry (MNRF) Land Information Ontario (LIO) geographic database, the following features were identified on or adjacent to the Subject lands (**Figure 2, Appendix A**):

- An Unnamed tributary of One Mile Creek flows along the northern Subject Lands boundary;
- The main channel of One Mile Creek flows in a northwesterly direction on the property west of the Subject Lands and it is crossed by the proposed access road from John Street; and
- Woodlands are present on the Subject Lands.

Within the broader local area, the following features were identified (**Figure 2, Appendix A**):

- Paradise Grove Plain Regionally Significant Life Science ANSI is located approximately 300 m northeast of the Subject Lands;
- A deer wintering area is located in the woodlot approximately 90 m south of the Subject Lands;
- Several units of the Two, and One Mile Creek Significant Wetland Complex are located approximately 1.1 km west of the Subject Lands; and
- An additional unit of this wetland is located on One Mile Creek approximately 1.9 km north of the Subject Lands.

### 3.1.2 Natural Heritage Information Centre Database

The Natural Heritage Information Centre (NHIC) database (MNR 2018) was searched for records of provincially significant plants, vegetation communities and wildlife on, and in the vicinity of the Subject Lands. The database provides occurrence data by 1 km<sup>2</sup> area squares, with 9 squares overlapping at least a portion of the Subject Lands (17PH5589, 17PH5590, 17PH5789, 17PH5689, 17PH5790, 17PH5690, 17PH5588, 17PH5788 and 17PH5688.) Within these blocks, the search revealed 94 records, 48 of which had an element occurrence rank of 'Historical' (greater than 50 years old) and are not addressed as current occurrences in this reporting. The following records are considered as current occurrences in this reporting:

- Species listed as Threatened or Endangered on the Species at Risk in Ontario (SARO) list:
  - Butternut (*Juglans cinerea*) – Endangered;
  - Eastern Flowering Dogwood (*Cornus florida*) – Endangered;
  - White Wood Aster (*Eurybia divaricata*) – Threatened;
  - Bobolink (*Dolichonyx oryzivorus*) – Threatened;
  - Eastern Meadowlark (*Sturnella magna*) – Threatened;
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
  - Swamp Rose-mallow (*Hibiscus moscheutos*) – Special Concern;
  - Lake Sturgeon (*Ichthyomyzon unicuspis*) – Special Concern;
  - Southern Ladies' Tresses (*Spiranthes lacera* var. *gracilis*) – S1;
  - Reflexed Sedge (*Carex retroflexa*) – S2;
  - Eggert's Thorn (*Crataegus coccinioides*) – S2;
  - Sundial Lupine (*Lupinus perennis*) – S2S3;
  - Black Gum (*Nyssa sylvatica*) – S3;
  - White-tinged Sedge (*Carex albicans* var. *albicans*) – S3;
  - Slightly Hirsute Sedge (*Carex hirsutella*) – S3; and
  - Biennial Gaura (*Oenothera gaura*) – S3.

### 3.1.3 Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (OBBA) contains detailed information on the population and distribution status of Ontario birds (Bird Studies Canada et al. 2006). The data are presented on 100 km<sup>2</sup> area squares, with one square covering the Subject Lands (17PH58). It should be noted that the

Subject Lands are a small component of the overall bird atlas square, and therefore it is unlikely that all bird species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in bird species presence and use.

A total of 91 bird species were recorded in the atlas square that overlaps with the Subject Lands, with the following species of interest noted:

- Species listed as Threatened or Endangered on the SARO list:
  - Chimney Swift (*Chaetura pelagica*) – Threatened;
  - Bank Swallow (*Rilparia riparia*) – Threatened;
  - Barn Swallow (*Hirundo rustica*) – Threatened;
  - Bobolink – Threatened;
  - Eastern Meadowlark – Threatened;
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
  - Eastern Wood-Pewee (*Contopus virens*); and
  - Wood Thrush (*Hyclocichla mustelina*).

#### **3.1.4 Ontario Reptile and Amphibian Atlas**

The Ontario Reptile and Amphibian Atlas contains detailed information on the population and distribution status of Ontario herpetofauna (Ontario Nature 2018). The data is presented on 100 km<sup>2</sup> area squares with one square overlapping the Subject Lands (17PH58). It should be noted that the Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all herpetofauna species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in herpetofauna species presence and use.

A total of 12 species were recorded in the atlas square that overlaps with the Subject Lands, of which 1 is a salamander species, 5 are frog and toad species, 3 are turtle species and 3 are snake species. No amphibian or reptile species identified as Threatened or Endangered on the SARO list were identified. Of the species that were identified, the following species of interest are noted:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
  - Map Turtle (*Graptemys geographica*) – Special Concern; and
  - Snapping Turtle (*Chelydra serpentina*) – Special Concern.



### **3.1.5 Ontario Butterfly and Moth Atlases**

The Ontario Butterfly and Moth Atlases (Toronto Entomologists' Association 2018a, 2018b) contain detailed information on the population and distribution status of Ontario butterflies and moths. The data is presented on 100 km<sup>2</sup> area squares with one square overlapping the Subject Lands (17PH58). It should be noted that the Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all herpetofauna species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in herpetofauna species presence and use.

Of the 18 lepidoptera species reported in the atlas square, three are Skipper species; three are Papilio species; three are Pierids species; two are Lycaenids species; and seven are Nymphalid species. Of these species, the following species of interest are noted:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
  - Monarch Butterfly (*Danaus plexipuss*) – *Special Concern*.

### **3.1.6 Fisheries and Oceans Canada Aquatic Species at Risk Distribution Mapping**

A review was conducted of the DFO Aquatic Species at Risk Distribution 2018 mapping that illustrates the distribution and population status of Species at Risk fish and mussels in Canada (DFO 2018). No aquatic species at risk were identified on the mapping as being present within One Mile Creek on or downstream from the Subject Lands.

### **3.1.7 One Mile Creek Watershed Plan**

The One Mile Creek Watershed is located in the Town of Niagara-On-The-Lake. The creek drains northwesterly from a highly urbanized area to an Epp Drain upstream of John Street that diverts the majority of the headwater flows (about 30% of the drainage area) easterly to the Niagara River. Flows during major rainfall events overflow the Epp Drain and release excess discharge into One Mile Creek. Surficial geology throughout the watershed is primarily fine grained, laminated glaciolacustrine deposits. These substrates generally have low permeability and associated sites do not function as potential recharge areas.

The Subject Lands occur within Management Zone 1 (2-year flow: 1.5 m<sup>3</sup>/s; bankfull flow 1.2 m<sup>3</sup>/s) of the One Mile Creek Watershed. In Zone 1, the creek channel is poorly defined and altered by straightening, widening and realignment to accommodate land use changes. Existing and recommended channel dimensions to support a 2-year flow event for reaches bounded by John Street and Charlotte Street are summarized in Tables 7.3 and 7.4, respectively, of the One Mile Creek Watershed Study (NPCA 2005).

## 3.2 Agency Discussions

### 3.2.1 Ontario Ministry of Natural Resources and Forestry

The MNRF Guelph District Information Request Form pertaining to Species at Risk and natural heritage features on, and adjacent to, the Subject Lands was submitted on April 6, 2018 and a response letter was received on June 26, 2018. The response letter identified a number of species at risk that are known to occur in the general area, including:

- Eastern Flowing Dogwood – Endangered;
- Butternut – Endangered;
- Tri-coloured Bat (*Perimyotis subflavus*) – Endangered;
- Chimney Swift – Threatened;
- Bank Swallow – Threatened;
- White Wood Aster – Threatened;
- Barn Swallow – Threatened;
- Bobolink – Threatened;
- Eastern Meadowlark – Threatened;
- Eastern Wood-Pewee – Special Concern; and
- Wood Thrush – Special Concern.

The MNRF noted that there are no provincially significant wetlands or evaluated non-provincially significant wetlands in the area of the Subject Lands.

The MNRF identified in their letter the presence of One Mile Creek and noted that Fathead Minnow (*Pimephales promelas*) have been documented in the area, although MNRF (Denyes pers. comm. 2018) later clarified that the 2004 record of Fathead Minnow was at the mouth of One Mile Creek on Lake Ontario. MNRF indicated in their letter that any in-water work in One Mile Creek should not occur between March 1 and June 30 and between September 1 and November 30 to protect critical fish life stages. However, MNRF (Denyes pers. comm. 2018) later clarified that MNRF would consider permitting in-water work within the fall window provided erosion and sedimentation controls were implemented and flows were not impeded.

The MNRF also included an overall list of species at risk known to occur in Niagara-on-the-Lake. This list has been used to screen for potential species at risk present on the Subject Lands, based on habitat types present.

Additional correspondence may be required with the Ministry of Environment, Conservation and Parks (MECP) which took over jurisdiction of the ESA from MNR in April 2019, to address SAR and their habitats.

### **3.2.2 Regional Municipality of Niagara**

As noted previously in section 1.2, the Regional Municipality of Niagara reviewed and provided comments on the EIS Terms of Reference (**Appendix C**).

Staff from the Regional Municipality of Niagara also participated in a woodland dripline staking exercise on the Subject Lands on July 9, 2018. The staked dripline has been used to define the boundary of the woodland for this report.

### **3.3 Technical Methods and Field Studies**

Savanta completed an initial site reconnaissance in May 2017 to develop a preliminary understanding of the types of natural features and associated wildlife habitat on and adjacent to the Subject Lands. An additional 1-day site reconnaissance was completed in March 2018 to further assess wildlife habitat types present on the Subject Lands, complete preliminary Ecological Land Classification (ELC) mapping, complete a leaf-off bat habitat assessment and confirm that the proposed 2018 field program would adequately address the habitat types found on an adjacent to the Subject Lands.

Savanta completed detailed ecological field surveys and natural environment inventories on and adjacent to the Subject Lands in 2018. The field investigations included seasonal botanical inventories (summer and fall), ELC of vegetation communities, breeding bird surveys, breeding amphibian surveys, reptile surveys, bat surveys, headwater drainage feature assessment (HDFA) and incidental wildlife observations. Some additional commentary regarding ecological field methods are presented in the following sections, and **Table 1 (Appendix B)** lists field dates and personnel engaged. Sampling locations associated with the field studies discussed below are shown in **Figure 3 (Appendix A)**. Professional qualifications of field staff that were responsible for completing ecological surveys are provided in **Appendix E**.

#### **3.3.1 Vegetation and ELC Methods**

Vegetation communities were first identified on aerial imagery and then verified in the field. Vegetation community types were confirmed, sampled and revised, if necessary, using the sampling protocol of the ELC for Southern Ontario (Lee et al. 1998). ELC was completed to the finest level of resolution (Vegetation Type) where feasible. Field investigations were completed on July 9, October 17 and November 21, 2018. Based on observations of the woodlands on the Subject Lands in March 2018, no spring botanical inventory was determined to be necessary, given the high level of disturbance on the woodland floor due to previous woodland management activities (completed by

the proponent under a permit issued by NPCA).

Species names generally follow nomenclature from the Database of Vascular Plants of Canada (Brouillet et al. 2010+). The provincial status of all plant species and vegetation communities is based on NHIC (2018). Identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

### **3.3.2 Wildlife Survey Methods**

#### Breeding Bird Surveys

Breeding bird surveys were conducted following protocols set forth by the Ontario Breeding Bird Atlas (Cadman et al. 2007). Surveys were conducted between dawn and five hours after dawn with suitable wind conditions, no thick fog or precipitation. Point count stations were located in various habitat types within the Subject Lands and combined with area searches to help determine the presence, variety and abundance of bird species. The location of the four point-count stations on the Subject Lands is shown in **Figure 3 (Appendix A)**. Each point count station was surveyed for 10 minutes for birds within 100 m and outside 100 m. All species recorded on a point-count were mapped to provide specific spatial information and were observed for signs of breeding behaviour. Surveys were conducted June 7, June 25, and July 4, 2018, satisfying the requirement to be at least 10 days apart. The third survey was conducted to determine if grassland breeding birds were present on the Subject Lands. Existing residential structures on the Subject Lands were also checked for the presence of Barn Swallow nests.

Both the Natural Heritage Information Centre (NHIC 2018) database and the Species at Risk in Ontario (SARO) list (Ontario Regulation 230/08) were reviewed to determine the current provincial status for each bird species.

#### Amphibian Call Count Surveys

Three rounds of evening amphibian call-count surveys (AMC) were conducted. Survey stations were identified using a preliminary review of aerial photography and were verified in the field to confirm the presence of suitable breeding habitat prior to completion of surveys.

These surveys followed standard protocols outlined in the Great Lakes Marsh Monitoring Program (BSC 2003). Surveys were conducted on warm nights with little wind. Surveys commenced one half hour before dusk and end before midnight. Visits were 15 days apart and as per protocols. The first occurred with a minimum nighttime air temperature of 5°C, the second visit with a minimum of 10°C

and the third visit with a minimum of 17°C. If noise from plane, road traffic and/or trains was present, monitoring was delayed and began during a quiet period.

Amphibian call-count surveys were conducted at three stations (**Figure 3, Appendix A**), which targeted potential breeding areas on the Subject Lands. Each station was surveyed for three minutes and a three-level call category system was used to identify the level and type of frog activity.

The standard call levels are:

- 1) Individual calls do not overlap and calling individuals can be discreetly counted;
- 2) Calls of individuals sometimes overlap but number of individuals can still be estimated; and
- 3) Overlap among calls seems continuous (full chorus) and a count estimate is impossible.

Anurans were recorded as within the station if they were within 100 m. All other species were recorded as incidental records heard outside the station.

#### Reptile Surveys

##### *a) Turtle Surveys*

The Subject Lands and accessible adjacent lands were walked to screen for potential turtle nesting areas, which could generally include features such as shores of wetlands and ponds, trails and driveways with granular substrate and farm field margins, so long as suitable substrate and sun exposure are present.

##### *b) Snake Surveys*

Three snake surveys were conducted in May 2018. Transect surveys were conducted along with scanning debris piles and building foundations for basking snakes. Reptile survey locations are shown on **Figure 3 (Appendix A)**.

Snake surveys were conducted on mild spring mornings (minimum 10°C) between 8:00 AM and 2:00 PM, with sunny or partly overcast conditions. A minimum temperature of 15 °C was required for overcast conditions. Data recorded during snake surveys includes: species observed and locations (UTM coordinates), air temperature, start and end time, and weather conditions. Survey methods are based on MNR Species at Risk protocols (2012) and Toronto Zoo snake survey protocols (Caverhill et al. 2011).

## Bat Surveys

### **a) *Habitat Assessment***

The Subject Lands were first assessed through aerial interpretation and ELC to identify whether any forest communities were present that would be suitable for bat maternity roosts. Given that forest communities were present, cavity tree density surveys were completed on March 16, 2018 to assess potential maternity roost habitat. Survey methods were developed based on professional experience, personal communication with MNRF, and survey guidelines as outlined in “Bats and Bat Habitats: Guidelines for Wind Power Projects” (MNR 2011).

All trees on the Subject Lands were assessed. Woodlands were surveyed using a transect approach, where transects were 5 m to 20 m apart (depending on visibility). All trees greater than or equal to 10 cm diameter-at-breast height (DBH) were visually inspected using binoculars to document any cavities that may or may not be present along the trunk or large branches. Each tree containing suitable cavities or peeling bark (preferred by the Tri-coloured Bat), had the following information recorded: UTM, species, DBH, approximate height, decay class, canopy cover, total number of cavities and height information for the top three cavities. Each tree was also photographed.

These results were then used to assess the quality of a woodland area to provide bat maternity roost habitat, with areas with  $\geq 10$  cavity trees (DBH greater than or equal to 25 cm) per hectare determined to provide the highest quality bat maternity roost habitat in accordance with MNRF guidelines.

### **b) *Acoustic Surveys***

Given that potential bat species at risk habitat was observed to be present following completion of habitat surveys, acoustic surveys were undertaken to confirm species and numbers of bats present. Survey methods were developed based on professional experience and advice from MNRF.

Surveys to detect bat species were carried out in June 2018 and were completed using Wildlife Acoustics Song Meter SM3BAT/SM4BAT recording devices over a duration of 10 consecutive evenings. The methods and results of these surveys are provided herein.

Survey stations were selected based on aerial interpretation, ELC vegetation community types, and ground-truthing for suitable bat micro-habitat such as clusters of  $\geq 10$  cm DBH trees with peeling bark, leaf clusters, and cavities. Three stations were identified on the Subject Lands associated with the woodland communities (**Figure 3, Appendix A**).

Passive acoustic recorders were programmed to begin recording at sunset and to end recording at sunrise. In addition, the SM3BAT/SM4BAT passive recorder microphones were elevated approximately 2 m above the ground to reduce background noise and echo. **Table 2 (Appendix B)** summarizes the

dates and times, and weather conditions encountered during bat acoustic surveys.

All ultrasonic recordings were filtered to eliminate recordings with high levels of noise or with no bat calls, and then further analyzed using SonoBat's auto-classification tool. Any calls with a positive identification were manually vetted by a wildlife ecologist with training in bat species identification by sonogram.

Both the NHIC (2018) database and the SARO list (Ontario Regulation 230/08) were reviewed to determine the current provincial status for each bat species detected.

### **3.3.3 Headwater Drainage Feature Assessment**

Potential headwater drainage features on the Subject Lands were assessed using the Credit Valley Conservation/Toronto Region and Conservation Authority (CVC/TRCA) 2014 "Evaluation, Classification and Management of Headwater Drainage Features Guidelines" (herein referred to as the HDFA Guidelines). These guidelines provide a standardized means of identifying and assessing the value of headwater drainage features and identifying long-term management recommendations to protect or maintain the important ecological or biophysical functions provided by headwater drainage features in a developing landscape.

Per the requirements of the HDFA Guidelines, Savanta completed three site visits to assess headwater drainage features on the Subject Lands on the following dates:

- Round 1 – April 13, 2018;
- Round 2 – May 30, 2018; and
- Round 3 – September 14, 2018.

During the first site visit all areas of the Subject Lands were walked to identify potential headwater drainage features. Each headwater drainage feature observed was separated into specific reaches, per the guidance on reach delineation in the HDFA Guidelines and data collection was completed for each reach based on OSAP protocols (Gorenz and Stanfield 2017), Section 4: Module 11 (Unconstrained Headwater Sampling). A photographic record of each headwater drainage feature was collected during each survey event.

The second and third round surveys occurred at least 48 hours after precipitation events so that drainage features would be at baseflow. The third survey (September 14, 2018) was completed outside the recommended summer (July/August) window as a result of the substantial amount of precipitation received and the difficulty in getting a period of at least 48 hours without a precipitation event. The survey completed in September was thought to still be representative of summer baseflow conditions and it was completed after 48 hours with no precipitation.

Following completion of the three survey rounds, the collected data was used to classify each headwater drainage feature, based on the HDFA Guideline hierarchy.

### **3.3.4 Aquatic Habitat Assessment**

An aquatic habitat assessment was completed on One Mile Creek on the proposed access road crossing from John Street. Assessments were completed on three occasions in association with the HDFA work being completed on other areas of the Subject Lands. Detailed biophysical and habitat observations were taken within approximately 10 m of the upstream and downstream ends of the existing culvert crossing. The extent of the assessment was limited by the presence of adjacent private property.

The aquatic habitat assessment consisted of a visual survey of existing instream and riparian habitat conditions along and adjacent to One Mile Creek at the access road crossing. The assessment took note of any of the following features:

- Hydrology (e.g. flowing or standing water);
- General watercourse morphology (e.g., riffle, run, pools);
- Wetted width and depth (at time of survey);
- Bed and bank substrate;
- Instream habitat (e.g. woody debris, aquatic vegetation, undercut banks);
- Presence of obstructions to fish movement (e.g., culverts, debris dams);
- Evidence of groundwater inputs (e.g., seeps or springs, iron flocculation/staining); and/or
- Riparian habitat.

A photographic record of habitat conditions on and adjacent to the Subject Lands was collected during the assessment.



## **4.0 BIO-PHYSICAL CHARACTERIZATION**

The following sections provide a bio-physical characterization of the Subject Lands, based on the background information reviewed and the results of ecological field investigations.

### **4.1 Physiography and Topography**

The Subject Lands are located the Iroquois Plain physiographic region, which in this area of the Niagara Region, is typified by stratified clay, sand and silt deposits of glaciolacustrine origin, underlain by deposits of silt and silt clay till (Chapman and Putnam 1984). This physiographic region encompasses the existing area around the Lake Ontario shoreline below the Niagara Escarpment that was historically occupied by the former glacial Lake Iroquois.

General topography in the Niagara-on-the-Lake area and this section of the Niagara Region is relatively flat with slight undulations. Topography on the Subject Lands is relatively flat, with a maximum relief of approximately 2.8 m. The Subject Lands gently slope downwards from the southwest corner to the northern limit.

### **4.2 Soils and Geology**

Regional geology in this area generally consists of glaciolacustrine sand, silt and clay deposits, with an overburden thickness of approximately 5 to 10 m. Soils on the Subject Lands primarily consist of silty clay, silty clay till and sandy silt till, with some silty sand and silt (Soil Engineers Ltd. 2018). Fill (consisting of sandy silt, rock fragments and brick debris) was observed near the residence in the northern corner of the Subject Lands (Soil Engineers Ltd. 2018).

The thickness of overburden soil deposits was found to range from 5.4 m to 9.1 m (Soil Engineers Ltd. 2018). The underlying bedrock consists of the Queenston Formation, which is dominated by shale with minor amounts of siltstone, dolostone and limestone (OGS 2005).

### **4.3 Groundwater**

Cole Engineering (2019) completed a hydrogeological investigation, consisting of the installation and monitoring of four groundwater wells on the Subject lands, including three shallow wells and one deep well. Groundwater level monitoring in the wells was completed on four occasions between September 2018 and August 2019. Monitoring results show that groundwater levels were generally lower in the northern portion of the Subject Lands and higher in the southern portion. Groundwater levels, which ranged from 1.27 to 4.12 meters below ground surface, were typically highest in March and lowest in September. Cole Engineering (2019) interpreted the wells as being representative of the shallow groundwater table.

Regional groundwater flow is generally to the north towards Lake Ontario or to the northeast towards the Niagara River (Waterloo Hydrogeologic 2005; cited in Cole Engineering 2019). Site specific studies completed by Cole Engineering (2019) indicated that shallow groundwater flow is also generally to the northeast, which is consistent with the regional flow direction.

The vertical flow gradient at the monitoring well in the southwestern corner of the Subject Lands was determined to be neutral to downward. Hydraulic conductivity is fairly low, which is consistent with the fine-grained soils (i.e., silty sand to silty clay) observed on site (Cole Engineering 2019).

Groundwater quality sampling completed by Cole Engineering in September 2018 found one exceedance of the Provincial Water Quality Objective for total cobalt and total uranium, although all other parameters met the respective objectives.

The Subject Lands are located within a Highly Vulnerable Aquifer (HVA) area that generally extends from East & West Line in the south to Simcoe Street to the west, the Niagara River to the east and areas north of John Street to the North (NPCA 2018b; NPCA 2011). The Source Water Protection Assessment Report (NPCA 2011) identifies this area as surficial overburden aquifer with high vulnerability due to surficial sand and/or gravel deposits at the surface. Cole Engineering Ltd. (2019) indicated that the Subject Lands are not located within a Wellhead Protection Area or a Significant Recharge Area. The Subject Lands are also not located within any of the Intake Protection Zones for municipal drinking water supplied identified in the Source Protection Plan (NPCA 2013).

#### **4.4 Surface Water**

##### **4.4.1 Watercourses**

One Mile Creek crosses the existing access road into the Subject Lands from John Street (**Figure 2, Appendix A**). Based on mapping from Niagara Peninsula Conservation Authority (NPCA), this creek originates from agricultural field drainage approximately 900 m southeast of the Subject Lands and ultimately discharges to Lake Ontario after flowing through the Niagara-on-the-Lake urban area. The creek has an overall drainage area of 5.2 km<sup>2</sup>, although approximately 1.7 km<sup>2</sup> has been diverted into the Epp Drain upstream from the Subject Lands.

The One Mile Creek Watershed Plan (Aquafor Beech Ltd. & LURA Consultants Ltd. 2005) notes that upstream from King Street (an area which includes the Subject Lands), the creek has poorly defined channel bed and banks and lacks valley characteristics. That Watershed Plan identifies the 1:2-year flood flow in One Mile Creek at John Street, downstream from the Subject Lands, at an estimated volume of approximately 1.5 m<sup>3</sup>/s. Upstream from King Street, One Mile Creek is considered to be intermittent (Aquafor Beech Ltd. & LURA Consultants Ltd. 2005). NPCA has defined a regional floodplain where One Mile Creek crosses the existing access road into the Subject Lands from John Street.

A tributary of One Mile Creek is also present on and adjacent to the Subject Lands (**Figure 2** and **Figure 4, Appendix A**). The tributary originates as a headwater drainage feature in an excavated ditch along the adjacent pedestrian trail next to the southwestern corner of the Subject Lands. It runs within the ditch for a distance of approximately 425 m before entering a culvert beneath the stone wall and running onto the Subject Lands. After exiting the culvert, it runs through an approximately 75 m long, channelized ditch on the 588 Charlotte Street residential property. After emerging from that culvert, it flows as a channelized feature adjacent to the backyards of the adjacent residences to the west of the Subject Lands, before flowing into One Mile Creek on the adjacent property. It flows along the Subject Lands property boundary for approximately 100 m. The swale-like feature is highly altered, with a wood retaining wall present along both banks along most of the feature and the property chain link fence running longitudinally down the feature in some locations. The channel bed consists primarily of gravel and small cobble overlying fine materials in the reaches where the channel is bound by retaining structures, with grasses and other herbaceous vegetation throughout, sometimes in high density. Small woody debris is present in some areas along the reach and overhead cover is abundant due to the riparian shrubs and trees. The downstream most reach on the Subject Lands was flowing in early spring but was dry during the late spring and late summer assessment periods.

Cole Engineering (2019) did not observe any flow within this tributary on the Subject Lands during four monitoring events (September and November 2018, March and August 2019). Cole Engineering (2019) installed mini-piezometers on the banks of this feature to assess groundwater-surface water interactions. Downward gradients were observed in November 2018 and March 2019. An estimated upward gradient was observed in August 2019, although there was no flow at this time. Based on the monitoring results, Cole Engineering (2019) interprets that the watercourse is not perennial and does not receive groundwater discharge.

The portions of the tributary on the Subject Lands were assessed as a headwater drainage feature, as discussed in the following section.

#### **4.4.2 Headwater Drainage Features**

##### Results

Four headwater drainage features were observed on and immediately adjacent to the Subject Lands, as shown in **Figure 4 (Appendix A)**. The primary headwater drainage feature (referred to as feature H1) is a tributary of One Mile Creek. The main channel of the feature originates in the southwest corner of the Subject Lands. In this area, it consists of an excavated ditch running along the adjacent pedestrian trail (off the Subject Lands). The upper reaches (H1-S2a and H1-S2b) appear to just receive inflow via overland flow from adjacent areas and were dry during the Round 1 assessment in early spring. The ditch (H1A-S1) on the opposite side of the pedestrian trail crosses underneath the trail via a culvert and flows into the downstream end of reach H1-S2. Vegetation within the trail corridor consists of a narrow band of scrubland and cultural woodland on both sides of the trail, generally

bordered by residential lawn areas. The feature flows through a culvert onto the Subject Lands, entering reach H1-S3, which flows as a channelized ditch, beneath the culvert on the existing access road into the former 588 Charlotte Street property and into reach H1-S4, which is channelized along the rear lots of adjacent residential properties. Reaches H1-S1, H1-S3, H1-S4 and H1A-S1 were flowing in early spring. The ditched reaches along the pedestrian trail (H1-S1 and H1-S1A) contained standing water in late spring (due to their excavated nature which promotes ponding), although the downstream reaches (H1-S3 and H1-S4) were dry in late spring. All headwater drainage features were dry during the late summer visit in mid-September 2018. The feature does not contain any direct fish habitat, although may contribute to downstream reaches of One Mile Creek known to support direct fish habitat (i.e., downstream from King Street). As a channelized ditch, the feature does not provide any terrestrial habitat function, as per the definitions in the Headwater Drainage Feature Assessment Guideline (TRCA and CVC 2014).

Several other headwater drainage features were observed on the Subject Lands (H1B-S1 and H1C-S1). These features are present within the manicured lawn on the former 588 Charlotte Street residential property. Although they may contain water during precipitation events, they were dry during all three surveys.

#### Classification and Management Recommendations

Part 2 of the HDFA Guidelines provides an approach to classify headwater drainage features by providing a step by step characterization of specific functions that may be associated with the features assessed, including hydrology, riparian function and provision of fish or terrestrial habitat. **Table 3 (Appendix B)** highlights the key components of this analysis based on the three rounds of HDFA completed in 2018.

Part 3 of the HDFA Guidelines provides guidance on linking the characteristics and functions of features to specific management recommendations that may be applied to those features. To assist, the HDFA Guidelines include Figure 2: "Flowing Chart Providing Direction on Management Options". The flow chart depicts various decision points associated with hydrology, fish habitat, riparian vegetation and terrestrial habitat, and ultimately leads the user to an appropriate management recommendation for each headwater drainage feature segment. Management recommendations can include the following:

- Protection;
- Conservation;
- Mitigation;
- Maintain Recharge;
- Maintain/Replicate Terrestrial Linkage; or
- No Management Required.

The flow chart was used to determine the management recommendation for the headwater drainage features on the Subject Lands (as identified in the second last column of **Table 3, Appendix B**). However, in some instances the management recommendations resulting from the HDFA Guidelines are not always warranted, given that the HDFA Guidelines do not cover every possible scenario, and in these instances, the guidelines permit flexibility to suggest alternate management recommendations. Therefore, a final management recommendation column has been added to identify the long-term recommendation from the project team.

The resulting final management recommendations for each reach, as depicted in **Figure 4 (Appendix A)**, along with the recommended management approaches for each management classification (from the HDFA Guidelines) is as follows:

### *Conservation*

The downstream most reach of the Tributary of One Mile Creek on the Subject Lands (reach H1-S4) received a final management recommendation of Conservation in recognition of the features contributions to downstream (off-site) fish habitat in One Mile Creek and the fact that the feature is likely considered to be a regulated watercourse by NPCA. The recommended management measures for Conservation reaches from the HDFA Guidelines (TRCA and CVC 2014) include:

- Maintain, relocate and/or enhance drainage feature and its riparian corridor zone;
- If catchment drainage had been previously removed or will be removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e. restore original catchment using clean roof drainage), as feasible;
- Maintain or replace on-site flows using mitigation measures and/or wetland creation, if necessary;
- Maintain or replace external flows;
- Use natural channel design techniques to maintain or enhance overall productivity of the reach; and/or
- Drainage feature must connect to downstream.

### *Mitigation*

The following reaches received a management recommendation of Mitigation:

- H1A-S1;
- H1-S1; and
- H1-S3.

These reaches were flowing in early spring but were not flowing during the late spring and late summer assessment periods. Therefore, they provide downstream hydrological contributions in early spring (and likely during other precipitation events) that supports downstream fish habitat in One Mile Creek. The upper reaches (H1A-S1 and H1-S1) consist of excavated ditches running along the pedestrian trail adjacent to the Subject Lands. The narrow bands along both sides of the trail consists of a mix of vegetation including some shrubs and trees. Based on these types of vegetation communities, the Riparian Vegetation classification would be Important, per the HDFA Guidelines (TRCA and CVC 2014), which would result in a management recommendation of Conservation. This management recommendation would then extend to the downstream reach (H1-S3) regardless of whether the reach warranted such a recommendation. However, as anthropogenic ditches running within narrow cultural vegetation communities along a pedestrian trail, the management recommendation of Conservation is not warranted, since these anthropogenic, highly altered ditch features provide minimal ecological and biophysical function. Therefore, a final management recommendation of Mitigation has been applied, in recognition of the seasonal downstream hydrological contributions to One Mile Creek (although the hydrological function is highly altered due to runoff from the trail and adjacent residential lawns).

The recommended management measures for Mitigation reaches from the HDFA Guidelines (TRCA and CVC 2014) include:

- Replicate or enhance functions through enhanced lot level conveyance measures, such as well-vegetated swales (herbaceous, shrub and tree material) to mimic online wet vegetation pockets or replicate through constructed wetland features connected to downstream;
- Replicate on-site flow and outlet flows at the top end of system to maintain feature functions with vegetated swales, bioswales etc. If catchment drainage has been previously removed due to diversion of stormwater flows, restore lost functions through enhanced lot level controls (i.e., restore original catchment using clean roof drainage); and
- Replication functions by lot level conveyance measures (e.g. vegetated swales) connected to the natural heritage system, as feasible and/or Low Impact Development (LID) stormwater options.

Since the trail drainage ditches are located off the Subject Lands, no alteration is anticipated to occur. As will be discussed further in section 7, reach H1-S3 will also be maintained in its current ditched form through the Subject Lands to convey flow from the trail ditches to the upstream end of reach H1-S4 (the regulated watercourse).

*No Management Required*

Features H1B-S1 and H1C-S1 consist of swales within an existing residential lawn on the Subject Lands. No water was observed in these features during any of the three assessment periods in 2018. Water may be present on a highly ephemeral basis (i.e., during precipitation events), but this is not

considered to be an important biophysical or ecological function in a developed landscape such as the Subject Lands. Therefore, no management recommendations are required, and these features can be removed.

#### **4.5 Landscape Ecology**

The Subject Lands straddle the border of the Niagara-on-the-Lake Urban Area. As such, the northern and western sides of the Subject Lands are bordered by single family residential communities fronting on The Promenade and Weatherstone Court. The eastern side of the Subject Lands is bounded by two large single-family estate home properties with a mix of open space and developed areas. Lands to the south of the Subject Lands are occupied by a winery and vineyard.

As shown on **Figure 2 (Appendix A)**, The Subject Lands are situated between two natural areas, including the Paradise Grove Plain ANSI to the east and a woodland providing deer wintering habitat to the west. The southern/western boundary of the Subject Lands is situated with the Greenbelt and is designated as part of the Greenbelt Natural Heritage System. Based on the Subject Land's location, the designation as part of the area as Natural Heritage System is likely on the basis of its potential function as an ecological corridor between these larger adjacent natural features.

#### **4.6 Vegetation**

The results of the ELC mapping and botanical investigations on the Subject Lands are discussed in the following sections. These surveys documented vegetation communities and species on the Subject Lands and provide baseline information to allow a determination of sensitivity and provincial and/or regional significance.

##### **4.6.1 Ecological Land Classification**

Over the course of the botanical field investigations, the Subject Lands underwent a transformation from two formerly vacant landscaped estates to the present largely disturbed condition. During the initial July 2018 visit, the properties consisted of the sprawling areas of two estate homes and associated landscaped surroundings of planted trees and ornamentals, with some cultural meadow. Most of the trees, shrubs and herbaceous plants were exotic. Natural vegetation consisted of remnants of forests and woodlots at the eastern and western sides of the property. However, vegetation removal activities around the former residential homes was completed in fall 2018 and the majority of the property, outside small remnant woodlot areas on the east and west boundaries is relatively barren and disturbed.

ELC mapping of the Subject Lands (based on the current condition) is shown on **Figure 5 (Appendix A)**. A detailed list and description of ELC units is provided in **Table 4 (Appendix B)**. No provincially rare vegetation communities were present on the Subject Lands (NHIC 2018).

#### 4.6.2 Vascular Plants

Botanical inventories completed on the Subject Lands in July and October 2018 identified a total of 162 species of vascular plants. Of that number, 84 (or 52%) are native and 78 (or 48%) are exotic. A full species list is included in **Table 5 (Appendix B)**. The majority of the native species (89%) are ranked S5 (secure in Ontario), with seven species (8%) ranked S4 (apparently secure in Ontario; NHIC 2018).

Two species are provincially rare and ranked as S1 or S2?, respectively: Ohio Buckeye (*Aesculus glabra*) and Honey-locust (*Gleditsia triacanthos*), however, both were evidently planted as ornamentals. No regionally (Niagara Region) rare plants were observed, as per the rankings of Oldham (2010). Two of the species recorded from the Subject Lands had a co-efficient of conservation value of 9 or 10: Pin Oak (*Quercus palustris*) and Ohio Buckeye (*Aesculus glabra*), of which the former is common in the wooded locations and the latter was planted.

#### 4.6.3 Evaluated Wetlands/Other Wetlands

The Land Information Ontario (LIO) database was accessed to determine if any wetlands known to the MNRF occur on or in the vicinity of the Subject Lands. Such wetlands could include PSWs, MNRF evaluated wetlands, unevaluated wetlands, or wetlands identified as "other". The results of this search show that the Two and One Mile Creek Significant Wetland Complex is (at its closest) 1.1 km west of the Subject Lands. No wetlands were identified through LIO as occurring on the Subject Lands, though field surveys did confirm the presence of an isolated deciduous swamp community, occupying an area of 0.23 ha. The wetland is located partially within the Greenbelt Plan Area.

This wetland is not connected to any other wetlands or watercourses via any surface drainage (there is no drainage outlet and all water within the wetland either evaporates or infiltrates). A thorough search of the area around the wetland was conducted during the headwater drainage feature assessment in early spring, but no outflow was observed, nor were any drainage features observed that appeared that they could convey flow from the wetland to a watercourse or other surface water drainage feature.

#### 4.7 Wildlife

The results from the wildlife field studies completed on and adjacent to the Subject Lands are summarized in the following sections. A list of all wildlife species recorded during the site investigations is provided in **Table 6 (Appendix B)**.



#### 4.7.1 Birds

A total of 33 bird species were observed within the Subject Lands. Of this total, 10 species are confirmed, nine are probable and seven are possible breeders on or adjacent to the Subject Lands. The remaining seven bird species are considered non-breeders, flyovers or migrants. All species observed on the Subject Lands are listed in **Table 7 (Appendix B)**.

All of the confirmed, probable or possible breeders are provincially ranked S5/S5B (common and secure), S4/S4B (apparently common and secure) or SNA (species not native to Ontario). Three species at risk were observed during the surveys, as described in the following paragraphs.

Eastern Wood-Pewee (Special Concern in Ontario and Canada) was observed singing from the woodland northeast of the Subject Lands (i.e., offsite and across John Street) during the Round 1 and Round 3 surveys. This species was not observed on the Subject Lands.

One Barn Swallow (Threatened in Ontario and Canada) was observed at PC1 (located along the access road from John Street). No nesting habitat for this species was observed on the Subject Lands and it appeared that this individual was foraging over the area. Barn Swallow were not observed during any of the other breeding bird survey rounds.

Chimney Swift (Threatened in Ontario and Canada) were observed foraging over the Subject Lands and adjacent lands during the Round 1 and Round 3 surveys. No suitable nesting habitat was identified on the Subject Lands, although a commercial building located approximately 700 m northwest of the Subject Lands was noted as having a large old-style chimney that could potentially provide nesting habitat for this species.

#### 4.7.2 Bats

##### Bat Habitat Assessment Results

Bat habitat was assessed within woodland communities, as well as in hedgerows, residential areas and in isolated trees within a cultural meadow community on the Subject Lands.

The results of the bat habitat assessment are provided in **Table 8 (Appendix B)** with suitable snag trees shown in **Figure 5 (Appendix A)**. Snag trees are present within the woodland community on the eastern side of the Subject Lands (which consists predominantly of disturbed cultural woodland with a small portion of deciduous swamp) and scattered throughout the rest of the Subject Lands (in cultural meadow and former residential areas). Based on the density of snags within the woodland (<10 snag trees/ha), it was determined that candidate bat maternity roosting Significant Wildlife Habitat is not found on the Subject Lands. As a result, acoustic surveys to confirm candidate bat maternity colony significant wildlife habitat were determined to not be required.

However, follow-up acoustic monitoring surveys were completed to determine whether species at risk bats were present, and potentially using the habitat within the swamp, as well as within the surrounding area.

### Bat Acoustic Survey Results

Six bat species were identified during the surveys on the Subject Lands: Big Brown Bat (*Eptesicus fuscus*), Silver-haired Bat (*Lasionycteris noctivagans*), Hoary Bat (*Lasiurus cinereus*), Eastern Red Bat (*Lasiurus borealis*), Little Brown Myotis (*Myotis lucifugus*) and Small-footed Myotis (*Myotis leibii*), as summarized in **Table 9 (Appendix B)**. During the 10 evenings of acoustic surveys, a total of 6363 recorded calls were low frequency calls and 140 recorded calls were high frequency calls.

Of the 6363 low frequency calls recorded, 1055 calls confirmed to be Big Brown Bat, 84 calls confirmed to be Silver-haired Bat, and 40 calls confirmed as Hoary Bat. The remaining 5184 low frequency calls were not identifiable to species.

Of the 140 high frequency calls recorded, 11 calls were confirmed as Eastern Red Bat, two calls confirmed as Eastern Small-footed Myotis, and one call confirmed as Little Brown Myotis. The remaining 124 high frequency calls were not identifiable to species, however; seven of those have 40K myotis characteristics.

Little Brown Myotis and Eastern Small-footed Myotis are listed as Endangered in Ontario and therefore, individuals and their habitat are protected under the provincial *Endangered Species Act, 2007*. Eastern Small-footed Myotis are not known to roost within woodland communities and therefore these observations are not considered further. The one confirmed recording of Little Brown Myotis, and the remaining unidentified Myotis calls, were recorded within the southern end of the cultural woodland vegetation community on the eastern side of the Subject Lands. In accordance with direction from MECP, only forest or swamp ELC communities are habitat for species at risk bats. Given that these individuals were recorded in low numbers and outside of the swamp community, habitat for species at risk bats is determined to not be present on the Subject Lands.

### **4.7.3 Amphibians**

One amphibian species (American Toad, *Anaxyrus americanus*) was recorded during the AMC surveys (**Table 6, Appendix B**). This species was recorded calling from two locations on Subject Lands during the first-round survey (AMC1 and AMC3) and from one location during the second-round survey (AMC2). The species was not recorded during the third-round survey. Detailed results of the AMC surveys are provided in **Table 10 (Appendix B)**. This species is provincially ranked S5 (common and secure).

#### 4.7.4 Reptiles

No reptiles were recorded on the Subject Lands during any of the ecological surveys completed.

##### Turtles

No suitable turtle nesting habitat is present on the Subject Lands. There is some limited gravel accumulation on the driveways leading into the Subject Lands, but these are hard packed areas with low suitability. The trail running adjacent to the western side of the Subject Lands is also not suitable for turtle nesting, given the presence of heavy vegetation, soil substrate and abundant wood chips.

##### Snakes

No snakes were recorded at any of the three survey transects or two area search locations on and adjacent to the Subject Lands in spring 2018, as documented in **Table 11 (Appendix B)**.

#### 4.7.5 Incidental Wildlife

Monarch Butterfly (designated as Special Concern in Ontario and Special Concern on the federal *Species at Risk Act*) was observed on the Subject Lands incidentally during the breeding bird surveys. Two Monarchs were observed during the Round 2 survey on June 25, 2018 with a small area of Milkweed. At the time of the observation, the Milkweed plants were small to medium in size, but the Monarchs may have been ovipositing. No eggs or larvae were observed during the survey. During the Round 3 survey on July 4, 2018, three Monarchs were observed. One was nectaring in a cultural meadow area with little Milkweed, while two were observed within an area of Milkweed within the cultural meadow. Milkweed areas were checked for presence of eggs and larvae but none were found.

Four mammal species (excluding Bats, which were discussed in section 4.7.2) were recorded incidentally during wildlife surveys on the Subject Lands, as noted in **Table 6 (Appendix B)**. All species observed are provincially ranked S5 (common and secure. No species were identified that are Species at Risk (Special Concern, Threatened or Endangered) or are SWH indicator species (includes provincially rare species ranked S1-S3 in NHIC 2018; MNRF 2015).

#### 4.8 Ecological Corridors and Linkages

As shown on **Figure 2 (Appendix A)** and discussed in section 4.5, The Subject Lands are generally situated between two natural areas; the Paradise Grove Plain ANSI to the northeast and a woodland providing deer wintering habitat to the southwest. The southeastern boundary of the Subject Lands is situated with the Greenbelt and is designated as part of the Greenbelt Natural Heritage System. Based on the Subject Land's location and positioning between two designated natural features, the

designation as part of the area of the Subject Lands as Natural Heritage System is likely on the basis of its potential function as an ecological corridor between these larger adjacent natural features. The width of the designated Greenbelt Natural Heritage System is approximately 200 m, with the portion on the Subject Lands being approximately 100 m wide. General land use within the corridor includes agricultural (winery and row crop), residential and open space, including the woodland and meadow on the Subject Lands. Wildlife movement in the area is expected to be concentrated within the Greenbelt corridor.

Given that the woodland to the southwest of the Subject Lands is designated by MNRF as a deer wintering area, it is likely that deer from other adjacent areas move to this woodland prior to winter. Deer from the woodland within the Paradise Grove Plain ANSI may therefore use the southern portion of the Subject Lands as a movement corridor. This may also facilitate movement of smaller mammals and other wildlife between the larger natural areas.

The corridor function of the Subject Lands is somewhat impaired. John Street, located to the east of the Subject Lands, serves as a partial barrier. The barrier increases the potential for mortality (i.e., wildlife-vehicle collisions).

#### **4.9 Fish and Fish Habitat**

##### One Mile Creek

One Mile Creek enters the Subject Lands via a culvert beneath a residential driveway on the adjacent property to the east. Within the boundaries of the Subject Lands, One Mile Creek has a wetted width of 103 cm to 182 cm and is 12 cm to 15 cm deep. The watercourse flows through an open-bottom culvert (470 cm x 110 cm x 52 cm) on the Subject Lands and receives downstream inputs from a tile drain outlet. Woody debris was present within the channel; however, this is unlikely to provide instream habitat for fish species given the presence of various obstructions to fish movement (i.e., culvert and weir) throughout the channel. Minimal understory vegetation occurs within the riparian zone and substrates are predominantly clay. One Mile Creek exits the Subject Lands through a weir with a low-level outlet beneath the residential driveway to the west.

Fisheries investigations conducted in 2005 (Aquafor Beech Ltd. & LURA Consultants Ltd. 2005) did not catch any fish upstream of King Street, which is located approximately 600 m downstream from the Subject Lands. Downstream from King Street, Creek Chub (*Semotilus atromaculatus*) were captured at several locations (Aquafor Beech Ltd. & LURA Consultants Ltd. 2005), with Pumpkinseed (*Lepomis gibbosus*), White Sucker (*Catostomus commersonii*), Fathead Minnow (*Pimephales promelas*) and Threespine Stickleback (*Gasterosteus aculeatus*) being captured in Lansdowne Pond, just upstream from the mouth of the creek at Lake Ontario (Diermair et al., 2003; cited in Aquafor Beech Ltd. & LURA Consultants Ltd. 2005). These species are considered to be warm-water fish species.

The One Mile Creek Watershed Plan (Aquafor Beech Ltd. & LURA Consultants Ltd. 2005) notes that upstream from King Street, One Mile Creek does not provide fish habitat, but flow contributions support downstream fish habitat. One Mile Creek has been classified by the MNR and the Watershed Plan as Type 3 (Marginal) fisheries habitat. Type 3 watercourses are typically considered to be marginal or highly degraded, not contributing directly to fish productivity (MNR 2000).

#### Tributary of One Mile Creek

The tributary of One Mile Creek on the Subject Lands does not provide direct fish habitat, similar to the One Mile Creek channel downstream. The upper reaches within the ditched areas along the adjacent pedestrian trail do not provide fish habitat. The lower reaches on the Subject Lands may provide some limited contributing function through conveyance of ephemeral flows to downstream reaches of One Mile Creek that do provide fish habitat, but the feature is highly degraded due to historic channelization and adjacent residential development. The One Mile Creek Watershed Plan (Aquafor Beech Ltd. & LURA Consultants Ltd. 2005) notes that no data is available to assess the type of fish habitat that is present in the feature. However, given that the One Mile Creek channel downstream is classified as Type 3 (Marginal) habitat, at most, the tributary of One Mile Creek should be considered Type 3 up to the culvert on the access road into the former 588 Charlotte Street residence. Further upstream reaches should not be considered fish habitat, given their highly altered nature (e.g., channelized, excavated ditches) and ephemeral nature.

#### **4.10 NPCA Regulated Areas**

One Mile Creek, which crosses the proposed access road into the Subject Lands from John Street is considered to be a regulated watercourse. No other features on the property are identified as regulated features by NPCA under Ontario Regulation (O.Reg.) 155/06 (*Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*), based on NPCA's online mapping tool (NPCA 2015). The tributary of One Mile Creek in the northern portion of the Subject Lands is not identified on the NPCA watercourse layer.

The wetland on the Subject Lands does not meet the definition of a wetland provided in the *Conservation Authorities Act* (R.S.O 1990, c. C.27), which states that wetland "means land that:

- a) Is seasonally or permanently covered by shallow water or has a water table close to or at its surface;
- b) Directly contributes to the hydrological function of a watershed through connection with a surface watercourse;
- c) Has hydric soils, the formation of which has been caused by the presence of abundant water; and,
- d) Has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposes and

no longer exhibits a wetland characteristic referred to in clause c) or d)” (NPCA 2018a).

Given that the wetland has no connection with a surface watercourse and therefore does not directly contribute to the hydrological function of a watershed, it does not meet this definition and is therefore not regulated by NPCA under O.Reg. 155/06. However, given that it meets the definition of a wetland under the PPS 2014 (MMAH 2014) it will be considered a wetland for the purposes of this EIS.

## 5.0 ANALYSIS OF ECOLOGICAL AND NATURAL HERITAGE SIGNIFICANCE

### 5.1 Provincial Policy Statement, 2020

Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Fish habitat;
- Habitat of endangered and threatened species; and
- Significant areas of natural and scientific interest (ANSIs).

The presence/absence of these elements on or adjacent to the Subject Lands is in detail in the following sections. The Natural Heritage Reference Manual (MNR 2010) was referenced to assess the potential significance of natural areas and associated functions. Where significant natural heritage features are present, the sensitivity of those features is also discussed.

#### 5.1.1 Significant Wetlands

Within Ontario, significant wetlands are identified by the MNRF or by their designates. Other evaluated or unevaluated wetlands may be identified for conservation by the municipality or the conservation authority.

There are no significant wetlands located on or within 120 m of the Subject Lands. The closest significant wetland is the Two, and One Mile Creek Wetland Complex, which is located approximately 1.1 km northwest of the Subject Lands. The majority of the units associated with this significant wetland complex are in association with Two Mile Creek, although one unit of the complex is present at the mouth of One Mile Creek, approximately 2.9 km downstream from the Subject Lands.

There is one unevaluated wetland on the Subject Lands, and this is discussed further in section 5.3.3.

#### 5.1.2 Significant Coastal Wetlands

Coastal wetlands include:

- Any wetland that is on the Great Lakes or their connecting channel; or
- Any wetland that is located on a tributary of the Great Lakes or their connecting channels and lies wholly or in part within two kilometres upstream of the 1:100-year floodline; or

- Any wetland located within two kilometres of the shore of the Great Lake or connecting waterbody if the 1:100-year floodline is not known (MNRF 2014).

Given that the wetland on the Subject Lands is not located on a tributary of the Great Lakes and it is also located greater than 2 km from the Great Lakes shoreline at the mouth of One Mile Creek (the watershed in which the wetland is located), it is not considered to be a coastal wetland. There are no Significant coastal wetlands on or within 120 m of the Subject Lands.

### **5.1.3 Significant Woodlands**

The PPS notes that significant woodlands should be defined and designated by the planning authority using criteria established by the MNRF. Under the Regional Municipality of Niagara Official Plan (Policy 7.B.1.5), significant woodlands are those woodlands that meet at least one of the following criteria:

- “Contain threatened or endangered species or species of concern;
- In size, be equal to or greater than:
  - 2 hectares, if located within or overlapping Urban Area boundaries;
  - 4 hectares, if located outside Urban Areas and north of the Niagara Escarpment;
  - 10 hectares, if located outside Urban Areas and south of the Escarpment;
- Contain interior woodland habitat at least 100 metres from the woodland boundaries;
- Contain older growth forest and be hectares or greater in area;
- Overlap or contain one or more of the other significant natural heritage features listed in Policies 7.B.1.3 or 7.B.1.4; or
- Abut or be crossed by a watercourse or water body and 2 or more hectares in area.”

Policy 7.B.1.3 of the Official Plan identifies the following significant natural heritage features, the presence of which within or overlapping with a woodland community would make the woodland be considered significant:

- Provincially significant wetlands;
- Provincially significant life science ANSIs;
- Significant habitat of endangered or threatened species;
- The following features within the Greenbelt NHS:
  - Wetlands;
  - Significant valleylands;
  - Significant Wildlife Habitat;
  - Habitat of species of concern;



- Publicly owned conservation lands;
- Savannahs;
- Tallgrass Prairies; and
- Alvars.

Policy 7.B.1.4 of the Official Plan identifies the following significant natural heritage features, the presence of which within or overlapping with a woodland community would make the woodland be considered significant:

- Significant habitat of species of concern;
- Regionally significant life science ANSIs;
- Other evaluated wetlands;
- Significant valleylands;
- Savannahs;
- Tallgrass prairies;
- Alvars; and
- publicly owned conservation lands.

For the purposes of those two Policies, “species of concern” refers to those species identified as Special Concern on the Species at Risk in Ontario List or as designated by COSEWIC or that has been given a ranking of S3 or higher by the NHIC (2018).

There are two woodland communities on the Subject Lands: the first is located on the eastern boundary, partially with the Greenbelt, while the second is located on the western boundary.

The eastern woodland does partially overlap with a wetland in the Greenbelt NHS and therefore, it is considered to be a significant woodland as a result. The woodland does not meet any of the other criteria for significance, since it is approximately 1.08 ha in size, was not found through targeted surveys to provide habitat for threatened or endangered species of concern, does not contain interior or old growth forest, does not contain and is not situated next to a watercourse or waterbody and does not contain or overlap with any of the other criteria listed in Policies 7.B.1.3 or 7.B.1.4.

The woodland on the western boundary of the Subject Lands does not meet any of the criteria to be considered significant. No Endangered or Threatened species or species of concern (per the Region of Niagara Official Plan designation) were observed within the woodland. The woodland is approximately 0.4 ha and does not contain any older growth or interior habitat. Finally, it does not contain any of the significant natural features listed in Policies 7.B.1.3 or 7.B.1.4.

Therefore, there is one significant woodland on the Subject Lands, as shown in **Figure 6 (Appendix A)**.

#### **5.1.4 Significant Valleylands**

There are no valleylands, and therefore, there are no significant valleylands on or within 120 m of the Subject Lands.

#### **5.1.5 Significant Wildlife Habitat**

Significant wildlife habitat (SWH) is one of the more complex natural heritage features to identify and evaluate. There are several provincial documents that provide guidance for identifying and evaluating SWH: the Natural Heritage Reference Manual (MNR 2010) and the SWH Ecoregion 6E Criterion Schedule (MNR 2015).

There are four general types of significant wildlife habitat: seasonal concentration areas, rare or specialized habitat, habitat for species of conservation concern and animal movement corridors. A detailed screening assessment of all SWH types was completed to support the assessment of potential SWH on the Subject Lands and this screening is provided in **Table 12 (Appendix B)**. SWH types that contained candidate habitat on the Subject Lands (based on habitat criteria being met) or within 120 m of the Subject Lands are discussed in the following sections. SWH types that could not be present on the Subject Lands due to lack of suitable habitat conditions are not specifically discussed in the following sections but are addressed in **Table 12 (Appendix B)**.

##### 5.1.5.1 Seasonal Concentration Areas of Animals

Seasonal concentration areas are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. The Subject Lands did not have suitable habitat conditions to provide any of the other seasonal concentration areas of animals SWH types identified in MNR (2015).

##### 5.1.5.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Rare, or specialized habitat, are two separate components. Rare habitats are those with vegetation communities that are considered rare in the province. SRANKS are rarity rankings applied to species at the 'state', or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy (Arlington, VA). Generally, community types with SRANKS of S1 to S3 (extremely rare to rare-uncommon in Ontario), as defined by the NHIC, could qualify. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant. As previously identified, there are no rare vegetation communities on or adjacent to the Subject Lands.

Specialized habitats require large areas of suitable habitat for successful breeding. This SWH type is community/diversity-based. The largest and least fragmented habitats are generally considered more

significant. Similar to the approach taken with Seasonal Concentration Areas, this SWH component requires specific habitat criteria to warrant targeted surveys. Only the results from candidate habitat surveys are discussed below.

There were several vernal pools and small wetland areas within the woodlands on the Subject Lands that met the habitat criteria to be considered candidate Woodland Amphibian Breeding Habitat (within or <120 m from woodlands). However, the only amphibian heard calling from the features was American Toad, which is not an indicator wildlife species for this type of habitat. Therefore, these vernal pools and small wetlands do not meet the criteria to be confirmed Significant Wildlife Habitat.

The Subject Lands or adjacent lands within 120 m did not have suitable habitat conditions to provide any of the other specialized habitat SWH types identified in MNRF (2015).

#### 5.1.5.3 Habitat for Species of Conservation Concern

Species of conservation concern include those that are rare and whose populations are significantly declining.

According to the Significant Wildlife Habitat Ecoregion Criterion Schedule (MNRF 2015), habitat for species of conservation concern includes five types of habitats:

- a) Marsh bird breeding habitat;
- b) Open country bird breeding habitat;
- c) Shrub/early successional bird breeding habitat;
- d) Terrestrial crayfish; and
- e) Special concern and rare wildlife species.

Habitats of species of conservation concern do not include habitats of Endangered or Threatened species, as identified by the *Endangered Species Act, 2007*. These are discussed in section 5.1.7.

Of the types of habitat for species of conservation concern that may be present, based on presence of suitable ELC Ecosite and other habitat criteria identified in MNRF (2015), additional information is provided in respect of Marsh Breeding Bird Habitat SWH and Terrestrial Crayfish SWH, both of which met the habitat criteria to be considered candidate SWH.

Given that there is several small meadow marsh (MAM2) and swamp communities on the Subject Lands, the habitat criteria for Marsh Bird Breeding Habitat was met, regardless of the fact that those wetland areas are very small and highly disturbed. However, none of the indicator bird species identified in the criteria Schedule (MNRF 2015) were found on the Subject Lands. Therefore, this type of habitat is considered absent.

Given that there is one swamp community on the Subject Lands, that habitat could be suitable for terrestrial crayfish. However, no evidence of terrestrial crayfish (i.e., chimneys) was noted during

multiple site investigations within the swamp area. Therefore, this type of SWH is considered to be absent.

As noted in **Table 12 (Appendix B)** and discussed in sections 3.1 and 3.2, the background review and MNRF noted the potential presence of 26 species in the general area. Suitable habitat conditions are present for some of the species, but none, except for Monarch, were observed during the ecological investigations conducted on the Subject Lands.

Monarch Butterfly (designated as Special Concern in Ontario and Special Concern on the federal *Species at Risk Act*) was observed on the Subject Lands incidentally during the breeding bird surveys. Two Monarchs were observed during the Round 2 survey on June 25, 2018 with a small area of Milkweed. At the time of the observation, the Milkweed plants were small to medium in size, but eggs or larvae were observed during the survey. During the Round 3 survey on July 4, 2018, three Monarchs were observed. One was nectaring in a cultural meadow area with little Milkweed, while two were observed within an area of Milkweed within the cultural meadow. Milkweed areas were checked for presence of eggs and larvae but none were found.

The Milkweed plants on the Subject Lands have only appeared to generate since tree removals occurred in 2016. Based on the small size of the Milkweed patches on the Subject Lands, the disturbed nature of the area (due to recent tree harvesting), the relatively limited number of Monarchs observed at any one time, and the lack of observed eggs and larvae, the habitat is not considered to be Significant Wildlife Habitat.

#### 5.1.5.4 Animal Movement Corridors

Animal movement corridors are areas that are traditionally used by wildlife to move from one habitat to another. This is usually in response to different seasonal habitat requirements. Some examples are trails used by deer to move to wintering areas and areas used by amphibians between breeding and summering habitat.

As neither deer wintering areas nor significant amphibian breeding habitats were identified on the Subject Lands, this SWH type is not present.

#### 5.1.5.5 Significant Wildlife Habitat Summary

Based on the results of the assessment described above and as outlined in **Table 12 (Appendix A)** there is no Significant Wildlife Habitat on the Subject Lands.

### **5.1.6 Fish Habitat**

Fish habitat, as defined in the federal *Fisheries Act*, c. F-14, means, "spawning grounds and any other areas including nursery, rearing, food supply, and migration areas on which fish depend directly or

indirectly in order to carry out their life processes". Fish, as defined in S.2 of the *Fisheries Act*, c. F-14, includes "parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals".

The One Mile Creek Watershed Plan notes that upstream from King Street, One Mile Creek does not provide fish habitat, but flow contributions support downstream fish habitat. One Mile Creek has been classified by the MNRF and the Watershed Plan as Type 3 (Marginal) fisheries habitat. Type 3 watercourses are typically considered to be marginal or highly degraded, not contributing directly to fish productivity (MNR 2000).

Similarly, the tributary of One Mile Creek on the Subject Lands does not provide direct fish habitat. The reach upstream to the culvert at the driveway into the former 588 Charlotte Street residence is considered to be Type 3 (Marginal) fish habitat. It provides some limited contributing function through conveyance of ephemeral flows to downstream reaches of One Mile Creek but is highly degraded due to adjacent residential development. The reaches upstream are anthropogenic drainage ditches and are not considered to be fish habitat.

Given the potential provision of biophysical and ecological contributions to downstream fish habitat off the Subject Lands, One Mile Creek and the lower reach of the One Mile Creek tributary on the Subject Lands are considered to be indirect fish habitat (**Figure 6, Appendix A**).

### **5.1.7 Habitat of Endangered and Threatened Species**

Endangered and threatened species are those identified on the SARO list. Threatened or Endangered species observed on the Subject Lands during ecological investigations completed in 2018 included:

- Little Brown Bat – Endangered;
- Small-footed Myotis – Endangered;
- Barn Swallow – Threatened; and
- Chimney Swift - Threatened.

The two Endangered bat species were recorded in low numbers at a monitoring station in the southern portion of the woodland located on the eastern side of the Subject Lands. No species at risk bats were observed in the mid-point or northern ends of this woodland. As discussed previously in section 4.7.2, this woodland was determined not to provide habitat for Endangered bat species.

One Barn Swallow (Threatened in Ontario and Canada) was observed at PC1 (located along the access road from John Street). Barn Swallow was noted by MNRF as having been observed in the general area (**Appendix C**). No nesting habitat for this species was observed on the Subject Lands

and it appeared that this individual was foraging over the area. Barn Swallow were not observed during any of the other breeding bird survey rounds.

Chimney Swift (Threatened in Ontario and Canada) were observed foraging over the Subject Lands and adjacent lands during the Round 1 and Round 3 surveys. No suitable nesting habitat was identified on the Subject Lands, although a commercial building located approximately 700 m northwest of the Subject Lands was noted as having a large old-style chimney that could potentially provide nesting habitat for this species.

No other Endangered or Threatened species were observed on the Subject Lands during the ecological investigations in 2018. Comments regarding each of the species identified by MNRF as being potentially present in the area (as noted in section 3.2.1) are provided below:

- Bank Swallow (Threatened) – this species was not observed during any of the breeding bird study rounds and no suitable breeding habitat for this species is present on the Subject Lands;
- Eastern Flowering Dogwood (Endangered) – this species was not observed during the three rounds of botanical inventory on the Subject Lands;
- White Wood Aster (Threatened) - this species was not observed during the three rounds of botanical inventory on the Subject Lands;
- Bobolink (Threatened) – this species was not observed during any of the breeding bird study rounds, including the third round which specifically targeted cultural meadow habitat on the Subject Lands;
- Eastern Meadowlark (Threatened) - this species was not observed during any of the breeding bird study rounds, including the third round which specifically targeted cultural meadow habitat on the Subject Lands; and
- Tri-coloured Bat (Endangered) – This species was not observed during acoustic studies conducted in the woodland on the Subject Lands.

The background information review did not identify any other Threatened or Endangered species as having been observed in the general area of the Subject Lands.

The presence/absence of Endangered and Threatened species on the Subject Lands will be addressed with MECP through the Information Gathering Form (IGF) process under the ESA 2007.

### **5.1.8 Significant ANSIs**

An ANSI is identified by the MNRF as *“areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education”* (MNR 2010).

A review of mapping from MNRF's LIO and NHIC databases did not indicate the presence of any provincially significant ANSI's on or within 120 m of the Subject Lands.

## **5.2 Greenbelt Plan Natural Heritage Features**

### **5.2.1 Key Natural Heritage Features**

Key Natural Heritage Features under the Greenbelt Plan (MMAH 2017) include:

- Habitat of Endangered species and Threatened species;
- Fish habitat;
- Wetlands;
- Life Science ANSIs;
- Significant valleylands;
- Significant Woodlands;
- Significant Wildlife Habitat (including habitat of special concern species);
- Sand barrens, savannahs and tallgrass prairies; and
- Alvars.

As discussed in section 5.1, the portion of the Subject Lands within the Greenbelt contains Significant Woodland and a wetland (within the Significant Woodland). Therefore, the portions of this woodland and wetland within the Greenbelt Plan area are considered to be Key Natural Heritage Features under the Greenbelt Plan (MMAH 2017).

### **5.2.2 Key Hydrological Features**

Key Hydrologic Features under the Greenbelt Plan (MMAH 2017) include:

- Permanent and intermittent streams;
- Lakes (and their littoral zones);
- Seepage areas and springs; and
- Wetlands.

There are no permanent or intermittent streams, lakes, seepage areas or springs within the portion of the Subject Lands within the Greenbelt. There is one headwater drainage feature on the lands adjacent to the Subject Lands, consisting of an excavated ditch running along the adjacent pedestrian trail, located partially within the Greenbelt. However, as an excavated drainage ditch, this feature is not considered to be a permanent or intermittent stream.

As identified in section 5.2.1, there is an unevaluated wetland that straddles the Greenbelt Plan area boundary within the woodland on the western side of the Subject Lands. The portion of the wetland

within the Greenbelt Plan boundary would therefore be identified as Key Hydrologic Feature under the Greenbelt Plan (MMAH 2017).

### 5.3 Other Features

#### 5.3.1 Regional Environmental Protection Areas

Policy 7.B.1.3 of the Region of Niagara Official Plan identifies Environmental Protection Areas to consist of the following features:

- Provincially significant wetlands;
- Provincially significant life science ANSIs;
- Significant habitat of endangered and threatened species; and,
- The following features within the Greenbelt Natural Heritage System
  - Wetlands;
  - Significant valleylands;
  - Significant woodlands;
  - Significant Wildlife Habitat;
  - Habitat of species of concern;
  - Publicly owned conservation lands; and
  - Savannahs, tallgrass prairies and alvars.

As discussed in section 5.1 there are no provincially significant wetlands or provincially significant life science ANSIs on the Subject Lands.

As noted in section 4.7.2, though limited numbers of Endangered bat species were documented at a monitoring station in the southern portion of the woodland on the eastern side of the Subject Lands, the feature was determined not provide habitat for species at risk bats in accordance with guidance from MECP. Therefore, the woodland where the species were observed would not be considered to meet the definition of “significant habitat”.

The only natural features observed within the portion of the property located within the Greenbelt NHS include the woodland (which includes a small wetland community) on the eastern side of the Subject Lands. Given that this woodland contains a wetland in the Greenbelt, it is considered to be a significant woodland (based on criteria in the Niagara Region Official Plan, as discussed in section 5.1.3). Therefore, the portion of this woodland within the Greenbelt NHS would meet the criteria to be considered an Environmental Protection Area. The portion of wetland within the Greenbelt would also meet the criteria to be considered an Environmental Protection Area.



Existing Official Plan mapping identifies a portion of this woodland as an Environmental Protection Area, although based on the analysis herein, the entire portion of the woodland within the Greenbelt NHS should be considered as an Environmental Protection Area (**Figure 6, Appendix A**).

No other natural features on the Subject Lands meet the definition of an Environmental Protection Area under the Region's Official Plan policies.

### **5.3.2 Regional Environmental Conservation Areas**

Policy 7.B.1.4 of the Region of Niagara Official Plan identifies Environmental Conservation Areas to consist of the following features:

- Significant woodlands;
- Significant wildlife habitat;
- Significant habitat of species of concern;
- Regionally significant life science ANSIs;
- Other evaluated wetlands;
- Significant valleylands;
- Savannahs, tallgrass prairie and alvars; and
- Publicly owned conservation lands.

As discussed in section 5.1.3, the woodland on the eastern side of the Subject Lands is considered to be a significant woodland (based on the presence of a small wetland in the Greenbelt portion). As discussed in section 5.3.1, the portion of this woodland located within the Greenbelt NHS is considered to be an Environmental Protection Area. The portion of the woodland outside the Greenbelt NHS (**Figure 6, Appendix A**) would meet the criteria to be an Environmental Conservation Area on the basis that it is considered to be a significant woodland.

No other natural features on the Subject Lands meet the definition of an Environmental Protection Area under the Region's Official Plan policies.

### **5.3.3 Ecological Corridors and Linkages**

As requested by the Regional Municipality of Niagara, this EIS is to assess the potential negative impacts on ecological corridors and linkages. As noted in section 4.7, the southern portion of the Subject Lands within the Greenbelt Natural Heritage System (**Figure 6, Appendix A**) may provide an ecological linkage function, since it is situated between two larger natural features.

### 5.3.4 Other Wetlands

There is one unevaluated wetland community on the Subject Lands, consisting of a small (0.23-ha) swamp within the woodland on the eastern side of the Subject Lands. The wetland is hydrologically isolated and has no discharge point, not does it receive any inputs from groundwater, based on the results of the hydrogeological assessment (Cole Engineering 2018). The wetland only appears to receive surface water runoff from a small local drainage area, which when combined with the poorly drained soils, promotes surface water ponding for a sufficient duration to facilitate growth of wetland vegetation species. The wetland had maximum water depths of 14 cm on May 1 and 6 cm on May 23, while it was dry on June 12, 2018.

The wetland does not discharge directly to any watercourse. Also, given that the local watercourse on the Subject Lands is not supported by groundwater discharge (Cole Engineering 2019) and that this wetland is located a minimum of approximately 165 m from the closest watercourse (One Mile Creek), this wetland does not appear to contribute to groundwater resources that support baseflow in any watercourses. The 0.23 ha wetland does not meet the general 2 ha threshold to be evaluated under the Ontario Wetland Evaluation System (OWES; MNRF 2013). Further, the closest evaluated wetland is more than 750 m away, and therefore, this small wetland unit could not be complexed into a larger wetland.

However, OWES (MNRF 2013) indicates that wetlands smaller than 2 ha can still be considered for evaluation, particularly when they are part of a larger complex. Therefore, the value of the wetland has been considered with respect to the evaluation criteria noted in OWES (MNRF 2013). The following observations with respect to wetland function are noted:

- The wetland is situated within a high productivity zone based on growing-degree days;
- The wetland is moderately productive based on wetland type (i.e., swamp);
- The wetland is isolated and therefore would generally have lower productivity than connected wetland types;
- Biodiversity within the wetland is relatively low since it only consists of one wetland type with limited vegetation community diversity;
- The wetland is not hydrologically connected to any other waterbody or wetland and there are no known evaluated wetlands within one kilometre;
- The wetland contains no permanent open water area;
- The size of the wetland is too small for consideration as a productive wood product area and does not contain other commercially valuable product (i.e., Wild Rice, commercial baitfish, furbearer habitat);

- The wetland is not known to support any recreational activity (i.e., hunting, fishing, nature appreciation), the wetland is not clearly distinct within the landscape and it is highly disturbed as a result of anthropogenic activity;
- The wetland is not used for education or research purposes;
- The wetland is located within and adjacent to a Settlement Area, but is held on private land;
- As an isolated wetland, it does provide some flood attenuation, although the catchment area and detention size within the wetland is very limited;
- The wetland provides no water quality maintenance function and is not an area of groundwater discharge;
- The wetland may provide some minimal groundwater recharge function, since it is an isolated wetland;
- Swamp wetlands are not considered to be rare wetland types in Ecodistrict 7E-3, although wetlands are generally rare within this Ecodistrict;
- No rare species are known to occur within the wetland (Endangered bat species were not found to use habitat within the wetland);
- The wetland does not provide any Significant Wildlife Habitat or fish habitat; and
- The wetland is not a coastal wetland.

Overall, the wetland exhibits limited ecological, hydrological and/or social functions that would make it a candidate for significance.

However, as noted in section 5.3.1, the portion of the wetland within the Greenbelt NHS is considered to be a Key Natural Heritage Feature and Key Hydrologic Feature under the Greenbelt Plan (MMAH 2017). The portion within the Greenbelt NHS meets the criteria to be considered an Environmental Protection Area under the Region of Niagara Official Plan. The portion of the wetland outside the Greenbelt NHS has not been designated as a significant natural feature in local or regional official plans or any provincial plans.

#### **5.4 Summary of Natural Heritage System Components Subject to Impact Assessment**

An analysis of existing natural heritage features on the Subject Lands was completed, followed by an evaluation of their significance against criteria in the NHRM, the NHRM and Ecoregion 6E Criteria Schedule, as well as the natural heritage policies of the Greenbelt and the Region of Niagara Official Plan (2014).

The results of this analysis determined that the following natural features are present that will need to be carried forward to the impact assessment in section 7.0:

- Significant Woodland (including parts designated as a Key Natural Heritage Feature in the Greenbelt Plan area and as Environmental Protection Area and Environmental Conservation Area as per the Region of Niagara Official Plan natural heritage policies);
- Wetland (the portion designated as a Key Natural Heritage Feature/Key Hydrologic Feature in the Greenbelt Plan area and as Environmental Protection Area as per the Region of Niagara Official Plan natural heritage policies);
- Fish Habitat (Type 3 – Marginal); and
- Ecological linkage/corridor.

## 6.0 DESCRIPTION OF DEVELOPMENT PROPOSAL

The proposed Draft Plan of Subdivision is shown in **Figure 7 (Appendix A)** and provided in **Appendix D**. The proposed subdivision will consist of 191 residential units, including 125 single detached lots and 66 semi-detached units, occupying 5.57 ha. Detached lots will typically be 10.8 m wide by 26 m deep, and semi-detached lots will typically be 8.53 m wide by 26 m deep, although exceptions to these general lot dimensions are proposed throughout the Draft Plan of Subdivision (e.g., at corner lots). A walkway will be constructed on the west side of the proposed subdivision to provide pedestrian linkage to the adjacent railway trail.

The proposed development will also consist of private condo roads (identified as Streets A through G on the Draft Plan of Subdivision) and associated right-of-ways, a park/stormwater Low Impact Development, walkways, natural heritage areas (i.e., woodlots, watercourses and buffers) and the undeveloped Greenbelt Plan area. Primary road access into the proposed subdivision is proposed from John Street, with emergency access provided from Charlotte Street. All roads will be private, with none in public ownership.

Removal of the portion of the Significant Woodland (Environmental Conservation Area) outside the Greenbelt NHS is proposed. The proposed development has incorporated a 30 m buffer from the residual woodland/wetland in the Greenbelt and a generally 10-m buffer from the edge of the bankfull channel of the Tributary of One Mile Creek. Buffers are described further in section 7.

Construction of the proposed development will commence in a phased manner. This will generally include:

- Installation of erosion and sedimentation control measures (including a temporary stormwater management pond);
- Site-wide grading;
- Installation of buried services (e.g., water distribution, stormwater and sanitary sewer pipes, electrical lines);
- Installation of stormwater management storage tank and associated infrastructure;
- Installation of condo roads;
- Construction of residential units; and
- Landscaping throughout the development, including open space.

As identified in the Functional Servicing Report (Schaeffers 2020) sanitary sewer servicing for the residences within the subdivision will be provided by a network of collection pipes within the roadways in the development, all flowing to the existing 200 mm diameter gravity sewer along Charlotte Street. Water supply for the proposed subdivision will be provided by a connection to the existing 150 mm

diameter watermain along Charlotte Street. Water will be supplied to individual residences within the proposed subdivision via a network of distribution piping within the roadways (Schaeffers 2020).

As discussed in the Functional Servicing Report (Schaeffers 2020) stormwater management will be primarily provided by an underground storage structure, to be located in the park in the northwest portion of the Subject Lands (Block 159). This underground storage tank will receive flows from approximately 8.32 ha of developed land. The tank will be divided into two sections; one to the north and one to the south of the existing ditch running through the area (forming the headwaters of the Tributary of One Mile Creek). Stormwater will be conveyed to the underground storage structure through a network of catch basins and storm water sewer infrastructure within the roadways in the proposed subdivision. The storage structure will discharge to the Tributary of One Mile Creek via a buried outlet pipe, which will extend from the structure, within the 10 m buffer of the adjacent reach of the Tributary (Block 163) discharging to the Tributary in the northeast corner of the Subject Lands. The stormwater capture and conveyance system has been designed to handle flows up to the 100-year storm, with emergency overland flow routes to One Mile Creek being provided for rainfall events exceeding the 100-year storm event (Schaeffers 2020).

The storage structure will provide for 60% removal of Total Suspended Solids (TSS), which is the basic level of protection required by NPCA for this reach of One Mile Creek. Catchbasin shields or oil-grit separators are proposed for pre-treatment, which, combined with the storage tank, would result in an overall 80% TSS removal (Schaeffers 2020).

To address erosion control requirements for the receiving watercourse, the storage tank will be designed to release the 25 mm 4-hour Chicago storm event over a duration of 48 hours, resulting in a peak outflow of 0.012 m<sup>3</sup>/s from the underground storage tank (Schaeffers 2020). The underground storage tank will control release rates to levels equal to or below the prescribed release rates.

A collector swale is proposed to collect water from within a portion of the Greenbelt, where a swale currently exists and direct it through a piping system towards the existing off-site conveyance ditch on the west side of the Subject Lands. A portion of the entrance road from Charlotte Street (0.029 ha) will drain uncontrolled to the existing storm sewer network on Charlotte Street, which is predicted to have a negligible impact on existing storm flows along Charlotte Street (Schaeffers 2020). The proposed access road/open space block from John Street (Block 166), which consists of a 0.39 ha drainage area made up of the paved access road and adjacent open space, will drain directly to One Mile Creek at the proposed bridge crossing (Schaeffers 2020).

A variety of Low Impact Development (LID) measures are proposed to maintain site-wide infiltration water balance, including topsoil amendment, disconnected downspouts and sub-surface infiltration trenches, as identified in the Functional Servicing Report (Schaeffers 2020).

Grading will be required throughout the portion of the Subject lands outside the Greenbelt boundary. The site will be graded such that all lot elevations remain above the 100-year flood elevation of One Mile Creek (Schaeffers 2020).

No consumptive water takings (i.e., from surface water features or groundwater wells) are anticipated to be required during or following completion of construction of the proposed subdivision. Construction dewatering may be required (e.g., during construction of residential basements or the proposed underground stormwater storage tanks or other underground servicing). Dewatering of more than 50,000 litres per day but less than 400,000 litres per day can be registered on the Environmental Activity and Sector Registry (EASR), while water takings in excess of 400,000 litres per day may require a Permit to Take Water from the Ministry of Environment, Conservation and Parks (Cole Engineering 2018). Requirements for construction dewatering will be confirmed following detailed review of site conditions and proposed infrastructure designs (Cole Engineering 2018). If construction dewatering is required, mitigation (e.g., erosion control, filtration) may be required to prevent negative impacts on receiving watercourses.

## 7.0 IMPACT ASSESSMENT, MITIGATION, AND ENHANCEMENT OPPORTUNITIES

This section of the EIS assesses the potential effects on the previously identified natural heritage features that could occur over the short-term and long-term, following implementation of the development plan discussed in section 6. Appropriate mitigation measures to avoid or minimize negative impacts and/or to enhance features and functions are suggested where practical.

Impacts from a proposed land development application can generally be considered in two broad categories, direct and indirect. Direct impacts are normally associated with the physical removal or alteration of natural features that could occur based upon a land use application, and indirect impacts may be changes or impacts to less visible functions or pathways that could cause negative impacts to natural heritage features over time.

Details of the impact assessment are provided within **Table 13** (following). Some key points are discussed in the following sections.

### 7.1 Significant Woodlands

The proposed Draft Plan of Subdivision will remove 0.10 ha of Significant Woodland outside the Greenbelt Plan area, in an area meeting the criteria to be an Environmental Conservation Area in accordance with the Niagara Region Official Plan. The remaining 0.98 ha of the Significant Woodland outside and within the Greenbelt Plan area will be protected in place and a 30 m vegetation protection zone (VPZ) will be added around the portion retained within the Greenbelt Plan area. A portion of the residual woodland will remain within the 30 m buffer from the Greenbelt Plan area. No transition grading from the adjacent development into the 30 m buffer will be required.

Removal of Significant Woodland will result in an overall reduction in the area of Significant Woodland on the Subject Lands and in the local area. The portion proposed for removal is a linear extension from the residual woodland that:

- Is relatively narrow (approximately 25 m to 40 m) in relation to the residual woodland (approximately 45 m to 65 m);
- Does not contain any at risk or locally rare vegetation species;
- Does not contain any provincially rare vegetation community types;
- Does not provide Significant Wildlife Habitat;
- Does not provide habitat for Endangered or Threatened species; and
- Does not significantly contribute to the overall ecological linkage function within the adjacent Greenbelt.

With respect to the width of the area being proposed for removal (25 m to 40 m) the average width would be less than the minimum required (i.e., 40 m) to be considered for evaluation of significance in the Natural Heritage Reference Manual (Section 7.3.2; MNR 2010). Given that the woodland was



assessed using the Niagara Region OP criteria, the average width was not considered, however, exclusion of this area of the woodland from assessment under the NHRM based on width characteristics does provide an important consideration when assessing the potential impacts of removal. If the feature was assessed solely using NHRM criteria, the northern extension proposed for partial removal would not have even been considered part of the Significant Woodland.

From an ecological perspective, the portion of woodland proposed for removal does not provide any significant ecological function, although it would provide generalized wildlife habitat and the overall benefits provided by woodlands (e.g., carbon sequestration, hydrological cycle regulation, aesthetic benefits). It is located outside the Greenbelt, which provides the primarily ecological linkage in the area.

Removal of a portion of the woodland will result in the creation of a new woodland edge at the limit of the residual woodland. However, the width of the woodland at the new edge location is approximately 25 m and this area generally consists of two large trees. Given that these two trees are already exposed to edge effects on their sides and that the 25 m width of the woodland provides minimal protection for species within the mid-point of the woodland (which are only a maximum of 12.5 m from the existing edge on the sides of the woodland), no incremental edge effects are anticipated to occur.

Solmar is proposing to implement a woodland restoration program within and adjacent to the residual portions of the woodland within the Greenbelt. The woodland restoration program will be developed during the detailed design for the proposed subdivision for approval at the site plan application stage. Conceptually, restoration will focus on replacement of dead/dying ash trees within the northwest corner of the residual woodland, as well as understory planting to enhance the vertical structure and overall wildlife habitat value within the woodland. These enhancements will improve the wildlife habitat value of the residual woodland, including the linkage component, given that the current woodland contains a sparse understory.

A 30 m VPZ will occur from the residual portions of the woodland within the Greenbelt. Existing woodland vegetation within the small portion of the 30 m VPZ outside the Greenbelt will be left in place to provide buffer function for the portion of the woodland within the greenbelt. No additional buffer will be placed to buffer this woodland vegetation within the 30 m VPZ.

The 30 m VPZ will generally assist in protecting the residual portions of the woodland from indirect negative effects from the adjacent development, including discouraging public access into the woodland (which could have negative impacts on ground cover vegetation and wildlife) and mitigating the spread of residential garden vegetation species (that could have negative impacts on woodland vegetation if they were to spread into the residual woodland). The 30 m VPZ will also prevent effects on the rooting zone of the residual woodland trees due to adjacent site alteration outside the VPZ.

Areas within the 30 m VPZ around the residual woodland are currently disturbed due to past vegetation removal/agricultural activities. These areas are proposed to be rehabilitated as part of an overall restoration plan that will be developed during future design stages. Restoration in these areas will focus on woodland enhancement and pollinator functions to improve the overall diversity of habitat and will be formulated in conjunction with input from the Region of Niagara.

Overall, removal of the 0.10 ha portion of Significant Woodland outside the Greenbelt, coupled with proposed woodland enhancement measures for the residual portion within the Greenbelt, and within the vegetation protection zone (which currently consists of highly disturbed soils with limited vegetation) is not anticipated to result in any net negative impact on the Region's Natural Heritage System within the area. The residual woodland will continue to provide a variety of generalized woodland functions and will continue to provide linkage habitat within the Greenbelt.

## 7.2 Fish Habitat

This section discusses the potential impacts of the proposed development on indirect fish habitat in One Mile Creek and its tributary on the Subject Lands. These features do not provide habitat that is directly utilized by fish but do contribute flow and allochthonous inputs to downstream areas off the Subject Lands that may be used by fish (i.e., within One Mile Creek downstream from King Street).

Potential impacts on fish habitat may occur as a result of:

### Construction

- Replacement of the existing water crossing structure on the existing driveway from John Street;
- Erosion and sedimentation due to construction activities on the Subject Lands;
- Accidental spills during construction on the Subject Lands;

### Post-Construction

- Changes in water quality due to urban run-off;
- Changes in flow; and,
- Changes in indirect fish habitat contributions downstream.

Each of these potential impacts is discussed in the following sections.

## ***Water Crossing Structure Replacement***

### Potential Permanent Effects and Mitigation

The existing One Mile Creek crossing on the driveway from John Street currently consists of a one-lane driveway with an open-bottom box culvert. To facilitate construction of a two-lane road, the existing structure will be replaced with a longer 1 m diameter HDPE culvert (Schaeffers 2020).

Savanta anticipates that the length of enclosure will be increased, which will result in removal of riparian vegetation adjacent to the existing crossing and an increased length of overhead enclosure and loss of natural channel bottom. However, the watercourse in this location does not provide direct habitat for fish, and therefore these on-site effects are not anticipated to have any negative impacts on downstream fish habitat, nor any effect on contributing habitat functions provided by the on-site watercourse. The minor loss of some riparian vegetation in the footprint of the widened road is not expected to have any measurable effect on water quality or contributing habitat functions in One Mile Creek.

Following completion of the detailed design for the proposed crossing structure, the proponent will prepare and submit a Request for Review to DFO to confirm if there are any requirements under the *Fisheries Act*. A permit from NPCA is also anticipated to be required for the proposed water crossing structure upgrade.

### Potential Temporary Effects and Mitigation during Construction

Given that fish are not anticipated to be present in the work area during water crossing structure installation (given that this reach of One Mile Creek does not appear to provide direct fish habitat), no direct effects on fish or fish habitat are anticipated to occur. However, indirect effects on fish and fish habitat downstream from the work area (i.e., downstream from King Street) could potentially occur due to erosion and sedimentation or accidental spills during installation of the bridge.

The primary mitigation measure to prevent adverse effects on fish due to in-water construction is adherence to in-water timing restriction windows specified by the MNRF. These state that, for warm-water watercourses in southern Ontario (such as One Mile Creek), in-water work should not be conducted between March 1 and June 30 to protect the reproductive periods of warm water fish species (Denyes pers. comm. 2018). Adherence to this mitigation will ensure that any disturbance that does occur in the work area does not negatively impact fish reproductive processes (e.g., spawning, incubation and emergence) that may be occurring further downstream in One Mile Creek. Given the intermittent nature of the watercourse, it may be possible to install the water crossing structure during periods when the watercourse is dry, which would prevent direct effects on fish downstream from the work area, since there would be no downstream conveyance of any sediment or spilled material generated during construction.

If installation of the water crossing structure is required when water is present in the watercourse, work site isolation measures may be required to dewater the work area, minimize in-water work requirements and facilitate proper installation of the structures. If work-site isolation is necessary, it could consist of dam and pump operations or various other types of bypass systems. These types of work site isolation systems would result in temporary direct effects on the watercourse within the dewatered work area but given that fish are not anticipated to be present in the reach, this will not result in any effects on fish or fish habitat. However, if water is present in One Mile Creek during installation of the structures, Savanta recommends that a fish rescue program be implemented prior to completion of work site isolation to ensure that if there are any fish within the work area (although not anticipated), they are safely removed to suitable habitats downstream from the work site. Should dewatering be necessary prior to fish removal, screening should be present around the pump inlet to prevent mortality due to impingement and/or entrainment.

Given this proposed mitigation, no negative impacts on downstream fish and fish habitat are anticipated to occur due to upgrades of the existing water crossing structure on One Mile Creek on the Subject Lands.

### ***Erosion and Sedimentation During Construction***

Erosion and sedimentation from the disturbed work area associated with the proposed development could potentially result in adverse effects to water quality (e.g., increased turbidity) on the Subject Lands and/or sedimentation and associated effects on fish (e.g., injury or mortality due to suspended sediments or altered habitat use) or fish habitat (e.g., loss of interstitial spaces in rocky areas, smothering of aquatic vegetation and/or incubating eggs) in areas of One Mile Creek that are known to provide direct fish habitat downstream from the Subject Lands.

Schaeffers (2020) has prepared an Erosion and Sedimentation Control (ESC) Plan to minimize the potential for erosion and sedimentation from the construction site. Basic elements of the plan include consideration for:

- Construction phasing to minimize the amount of time soils are barren and therefore, more susceptible to erosion;
- Requirements and timing for rehabilitation of disturbed areas;
- Stormwater management strategies during construction (including cut off swales, a temporary sediment pond and sediment traps throughout the Subject Lands);
- Erosion prevention measures (e.g., erosion control matting);
- Sedimentation control measures (e.g., silt fences, mud mats, Siltsoxx, Filtrex check dams); and,
- Inspection and adaptive management considerations.

Implementation of an effective ESC Plan, incorporating both erosion and sediment controls, coupled with regular inspection and implementation of any remedial actions necessary to ensure effective performance, is anticipated to be largely effective in preventing the movement of eroded soil particles off-site towards fish habitat in One Mile Creek.

The temporary sediment pond is proposed within approximately 2 m of the Tributary of One Mile Creek in the northern portion of the Subject Lands. The proposed location currently consists of a grassed lawn and none of the shrub vegetation within the narrow band of riparian vegetation adjacent to the tributary is anticipated to be impacted by construction of the pond. Given that the tributary is not groundwater fed (Cole Engineering 2019), no impacts on feature hydrology are anticipated as a result of excavation and presence of the temporary pond adjacent to the watercourse. Following completion of construction, the pond will be decommissioned, and the area will be restored and revegetated to function as part of the buffer for the tributary. No impacts on the contributing fish habitat function of the tributary are anticipated as a result of the temporary installation and operation of the pond during construction.

Overall, no adverse effects to direct fish and fish habitat are predicted to occur as a result of erosion and sedimentation during construction, provided an effective ESC Plan, including monitoring and adaptive management, is implemented.

### ***Accidental Spills During Construction***

Accidental spills of potentially hazardous materials (e.g., fuel and oil from heavy equipment), if transported to One Mile Creek and/or its tributary on the Subject Lands and eventually to downstream portions of the creek that provide direct fish habitat (i.e., downstream from King Street), could cause stress or injury to fish and other aquatic biota (e.g., benthic invertebrates).

In order to mitigate the potential for adverse effects on fish and fish habitat due to accidental spills during construction, spill prevention and response and response measures regarding material handling and storage protocols, mitigation measures (e.g., spill kits on-site), monitoring measures and spill response plans (i.e., emergency contact procedures, including the Spills Action Centre, and response measures including containment and clean-up) will be implemented during construction. Implementation of an effective spill prevention and response plan is anticipated to be largely effective in preventing adverse effects on fish and fish habitat.

### ***Post-Construction Impacts on Water Quality***

Surface water runoff that is not infiltrated into the ground or directed to the residual natural features as overland flow will be collected by storm sewers within the proposed development and directed to the proposed stormwater management storage tank for treatment for suspended solids prior to discharge to the tributary of One Mile Creek. The proposed stormwater management system will

provide enhanced level quality control (80% TSS removal) to mitigate potential effects on water quality in the watercourse due to suspended sediments and turbidity. Retention in the storage tank will also assist in mitigating increases in surface water runoff from the proposed development, since discharge rates will meet requirements for retention to prevent significant impacts on the watercourse (e.g., erosion due to increased peak flows) and associated downstream fish habitat.

Some surface water on the Subject Lands will infiltrate into and/or flow through residential lawns and open spaces towards the Tributary of One Mile Creek on the Subject Lands. This runoff or infiltration water could potentially be impaired due to use of potential contaminants (e.g., lawn fertilizers) or other anthropogenic land use activities (including accidental spills). However, a 10 m buffer will be maintained from the existing banks of the Tributary of One Mile Creek on the Subject Lands (Block 163) and this buffer area will assist in mitigating potential effects on surface water quality in the feature, and corresponding effects on downstream fish habitat. No transition grading from adjacent residential lots into the buffer will be required. Disturbed areas of the 10 m buffer (including areas disturbed due to installation of the buried discharge pipe from the underground storage tanks) will be planted with a mix of suitable vegetation species to provide long-term erosion prevention and hydrology regulation functions within the setback area. It is recommended that riparian planting plans be developed as part of the overall landscaping plan to enhance those riparian areas that may currently be lacking in natural vegetation, and hence, riparian function, due to existing residential land uses on the Subject Lands.

The buffer will prevent direct site alteration within the watercourse and will provide additional riparian buffer functions for the watercourse. Specifically, the buffer will provide some quantity and quality control for stormwater runoff, which may originate from adjacent development blocks (e.g., rear lots backing onto the limit of development) or within the buffer itself (Block 163). The vegetated buffer will assist in managing surface water runoff quantity through the processes of storage (associated with micro-topography within the setback), evaporation, infiltration and transpiration. The buffer will also function to maintain water quality in the watercourse by trapping sediments and slowing the flow of surface water to promote uptake of nutrients or contaminants by vegetation. In addition, the buffer will also provide organic inputs to the wetland and headwater drainage feature, which may contribute to downstream direct fish habitat.

The upstream reaches of the Tributary on and adjacent to the Subject Lands will also remain as open channel (ditched) features similar to their current condition. The ditch within the park (Block 159) will remain in its current location and will be surrounded by managed parkland on both sides (generally greater than 30 m from adjacent roads and residential lots). The vegetation within the parkland will assist in maintaining the quality of any direct surface water runoff to the feature.

Given the above, no negative impacts on downstream fish habitat in One Mile Creek as a result of changes in water quality are anticipated to occur.

### ***Post-Construction Impacts on Water Balance***

Cole Engineering (2019) completed a site-wide water balance to compare pre-development and post-development infiltration conditions (i.e., recharge and runoff volumes) on the Subject Lands. Under pre-development conditions, infiltration was estimated to comprise 16% of the total precipitation (i.e., 141 mm/year or 17,457 m<sup>3</sup>/year), while runoff was estimated to comprise 12% of total precipitation. Evapotranspiration is estimated to account for 72% of total precipitation.

Under post-development conditions, in the absence of specific mitigation, there is a predicted increase in surface water runoff and corresponding decrease in infiltration and evaporation due to increased imperviousness on the Subject Lands (Cole Engineering 2019). Infiltration would be reduced to approximately 6% of total precipitation (i.e., 52 mm/year or 6,420 m<sup>3</sup>/year), while surface water runoff would increase to approximately 55% of total precipitation. Therefore, if unmitigated, infiltration would be reduced by 89 mm/year (11,037 m<sup>3</sup>/year). This reduction in groundwater infiltration could result in long-term impacts on the regional groundwater system, although Cole Engineering (2019) predicted that the impact would be small at the watershed scale, given that the Subject Lands are not located in a significant groundwater recharge area. Reduced infiltration would not be expected to impact hydrology in the Tributary of One Mile Creek at the northern end of the Subject Lands, since the feature is not interpreted to receive groundwater discharge (Cole Engineering 2019). The proposed underground storage tanks will be wrapped with an impermeable sheet to prevent groundwater from entering the storage system and being discharged as surface water to the Tributary of One Mile Creek (Schaeffers 2020).

LID measures, including topsoil addition (to a minimum depth of 300 mm in lawn areas), disconnected downspouts (directing roof runoff to lawn areas) and infiltration trenches (located throughout the proposed subdivision) will be used to maintain existing groundwater infiltration rates (Schaeffers 2020). A groundwater balance completed by Schaeffers (2019) found that the pre-development infiltration rate can be maintained through the capture of clean water from roof and backyard areas directed to infiltration trenches. Therefore, existing groundwater balance on the Subject Land will be met post-development (Schaeffers 2020).

Given that groundwater balance will be maintained through the use of LIDs, off-site drainage will be maintained, and the proposed stormwater management system will provide the necessary quantity and erosion control criteria, no negative impacts on hydrology and associated fish habitat in downstream reaches of One Mile Creek are anticipated as a result of the proposed development.

### ***Post-Construction Impacts on Indirect Habitat Contributions***

The primary functions provided by the existing indirect fish habitat on the Subject Lands (comprised of headwater reaches of the Tributary of One Mile Creek) include hydrological contributions and complex habitat inputs (e.g., nutrients and organic material within the flow) that support downstream

fish habitat in the watercourse off the Subject Lands. All existing reaches of the Tributary on and off (i.e., upstream) of the Subject Lands will be maintained in an open channel condition, similar to existing conditions. Therefore, there will not be any loss of indirect fish habitat channel length as a result of the proposed development.

The reach of the Tributary of One Mile Creek downstream from the existing driveway into the former 588 Charlotte Street property will be maintained as an open channel in its current form and it will be protected with a 10 m buffer from the channel top of bank to the proposed adjacent lot lines. A vegetation restoration plan will be prepared for the setback area during the detailed design process. Existing vegetation within the area consisted of an old-field meadow. Enhancement with a variety of native vegetation materials, including trees, shrubs and meadow species is anticipated to result in enhanced ecological function of the area and contributing riparian functions provided by the area in support of the watercourse. Riparian functions will include regulation of stormwater runoff from adjacent residential lots and provision of shading and allochthonous inputs for the watercourse.

Temporary impacts on the buffer area will occur during installation of the buried discharge pipe from the underground storage tanks, which will run the length of the buffer on Block 163. The pipe will be maintained as far from the watercourse as possible and post-construction restoration, including topsoil replacement and planting, will occur to prevent long-term negative impacts on the buffer and its riparian function.

The reach of the tributary upstream from the existing driveway into the former 588 Charlotte Street property (which classified as requiring Mitigation under the HDFA) will also be maintained in its current form as an open channel ditch, surrounded by parkland. Maintenance of this feature is required to continue to convey off-site (upstream) drainage from the ditches along the adjacent pedestrian walkway. No specific unmanaged buffer is proposed, but the ditch will be surrounded by vegetated parkland. It is recommended that an unmanaged corridor of at least 5 m from the edge of the ditch is maintained (e.g., no mowing of vegetation) to enhance buffer functions in this reach, which will contribute to indirect habitat contributions.

The proposed stormwater management and drainage mitigation measures, along with maintenance of the downstream reach of the tributary on the Subject Lands and enhancements to existing riparian habitat adjacent to this tributary will ensure that these indirect functions are maintained to continue to support downstream fish communities. No negative impacts on downstream fish communities are anticipated as a result of changes on the Subject Lands.

Some temporary impacts on the upstream reaches of the tributary (e.g., at the upstream property line) may occur during installation of buried servicing (i.e., sanitary sewers and water distribution piping). These features will be buried beneath the shallow channel, with no long-term impacts on form or function. No details in installation methodology have been developed at this stage, but mitigation will be address during the detailed design and construction planning stage. Mitigation would include



requirements associated with timing of in-channel work, water management and erosion and sedimentation control. Provided mitigation is effective, no negative impacts on downstream fish habitat (off the Subject Lands) are anticipated due to construction and long-term presence of buried infrastructure crossing the upstream reach of the Tributary of One Mile Creek on the Subject Lands.

### 7.3 Unevaluated Wetlands

A 0.23 ha isolated deciduous swamp (SWD3-2) community is present within the woodland on the Subject Lands. The wetland is not supported by groundwater (Cole Engineering 2019) and only receives surface water from direct precipitation and overland flow from the local area during snowmelt and precipitation events. There are no headwater drainage features that direct surface flows to the wetland. The wetland is isolated, with no outflow; water in the feature either infiltrates, is taken up by vegetation or evaporates.

A small portion of this wetland is located within the Greenbelt and therefore, this area meets the criteria to be considered as an Environmental Protection Area under the Region of Niagara Official Plan (2014) criteria. This section of the wetland will be protected from development and a 30 m VPZ will be applied. Restoration within the 30 m VPZ is anticipated to result in localized benefits to the residual wetland, since the current VPZ area consists of highly disturbed soils with limited vegetation development.

A 0.10 ha portion of the wetland outside the Greenbelt is proposed for removal, as shown on **Figure 8 (Appendix A)**. The portion of the wetland within the 30 m VPZ from the Greenbelt will remain in place to provide buffer functions for the residual 0.13 ha portion of the wetland and overall woodland within the Greenbelt. No additional buffer will be provided to the residual wetland/woodland vegetation community within the 30 m VPZ from the Greenbelt.

The residual wetland will continue to receive direct hydrological inputs from precipitation and snowmelt within the feature and will also receive overland flow from the adjacent 30 m VPZ and areas within the Greenbelt, as well as potentially from adjacent rear yards and clean roof drainage. Schaeffers (2020) completed an evaluation of drainage area to the wetland and found that the post-development drainage area could be up to 94% of the existing wetland drainage area if adjacent rear lots and roofs are incorporated into the local drainage plan for the wetland. During the detailed design process, which will include identification of woodland restoration objectives, an evaluation of water balance requirements will be completed to assess water requirements to maintain wetland form and function.

### 7.4 Ecological Linkages/Corridors

The area of the Subject Lands within the Greenbelt Natural Heritage System provides an ecological linkage between the adjacent Paradise Grove Plain ANSI and associated natural areas north and

east of the Subject Lands to the woodland and headwaters of Two Mile Creek to the south and east of the Subject Lands. The woodland south of the Subject Lands has been identified as a deer wintering area by MNRF.

No development will occur within the Greenbelt Natural Heritage System on the Subject Lands, although some minor transition grading from the lots backing onto the Greenbelt Plan boundary is proposed. This grading will encroach a maximum of 2 m into the Greenbelt Plan boundary (although it will not encroach into the 30 m VPZ from the Significant Woodland within the Greenbelt NHS). The graded area will be revegetated following completion of grading activities.

Development on adjacent lands and minor grading encroachment at the edge of the Greenbelt Plan area is not anticipated to negatively impact the function of the ecological linkage within the Greenbelt over the long term. Some short-term impact on wildlife use of the linkage may occur during the construction period due to noise and increased human presence on the Subject Lands. Wildlife may use other portions of the linkage adjacent to the Subject Lands (i.e., within the adjacent winery grape vine area) or may use the linkage on the Subject Lands outside of periods when construction is actively occurring. Given the highly disturbed nature of the overall area, wildlife are likely tolerant of some degree of disturbance and noise/human presence. Opportunities to enhance the ecological function of the linkage within the Greenbelt Natural Heritage System will be examined during the detailed design process (e.g., through woodland restoration, vegetation protection zone plantings).

Therefore, no negative impacts on ecological linkages are anticipated due to the proposed adjacent development.

## 7.5 Groundwater Quality

The peer review comments on the Scoped EIS Terms of Reference (provided in **Appendix C**) indicated that the EIS should address potential impacts on the groundwater system, given that the Subject Lands are located within an area identified by NPCA (2009) as a Highly Vulnerable Aquifer. Cole Engineering Ltd. (2019) addressed potential impacts on groundwater quality and recommended the use of collars or other methods on subsurface infrastructure (e.g., sewer or water distribution piping) to prevent preferential flow of groundwater and associated potential contaminants. Schaeffers (2020) indicated that the underground stormwater storage tanks will be wrapped with an impermeable lining to prevent flow of groundwater into the tanks. Cole Engineering Ltd. (2019) also indicated that the areas around the Subject Lands are generally serviced by municipal water (from the Niagara Falls water treatment plant and the DeCew Falls water treatment Plant) and they indicated that potential impacts on nearby groundwater users as a result of the proposed development are unlikely.

## **8.0 CONCLUSIONS AND RECOMMENDATIONS**

This EIS has been developed as part of the planning process for the proposed residential development at 200 John Street and 588 Charlotte Street in Niagara-on-the-Lake, Ontario.

An assessment of impacts on natural features and their associated functions has been conducted, and discussed in relation to the PPS, related guidance documents, the Greenbelt Plan and the local and regional official plans.

The concept plan includes the following activities that will cause direct impacts on the identified natural heritage features:

- Grading and vegetation removal;
- Installation and operation of stormwater management infrastructure; and
- Installation and long-term presence of a residential community.

Based upon the natural heritage feature inventories and analyses carried out, the following conclusions are provided:

- The results of the natural heritage assessment identified the following significant natural heritage features on or within 120 m of the Subject Lands:
  - Significant Woodland (including parts designated as a Key Natural Heritage Feature in the Greenbelt Plan area and as Environmental Protection Area and Environmental Conservation Area as per the Region of Niagara Official Plan natural heritage policies);
  - Wetland (the portion designated as a Key Natural Heritage Feature/Key Hydrologic Feature in the Greenbelt Plan area and as Environmental protection Area as per the Region of Niagara Official Plan natural heritage policies);
  - Fish Habitat (Type 3 - Marginal);
  - Ecological linkage/corridor;
- Significant Woodland within the Greenbelt Plan area will be protected with a 30 m VPZ. No development or site alteration is proposed within the VPZ;
- A 0.10-ha piece of Significant Woodland outside the Greenbelt Plan and associated 30 m buffer will be removed to facilitate the proposed development. This portion of the woodland is narrow and provides limited ecological functions. Restoration of the residual woodland, combined with enhanced vegetation within the vegetation protection zone will result in enhancements to overall woodland function on the Subject Lands, such that removal of the low functioning portion outside the Greenbelt Plan area will result in no negative impact on the residual portion of the woodland or the Region's Core Natural Heritage System;

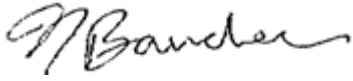
- Approximately 0.10-ha of unevaluated wetland outside the Greenbelt Plan and associated 30 m buffer will be removed to facilitate the proposed development. This wetland is not connected to any surface watercourse and therefore, does not contribute to the hydrological function of the watershed. The wetland does not provide any Significant Wildlife Habitat. Removal of 0.10-ha of wetland will not result in any negative impacts on significant natural heritage features. The residual wetland will continue to receive hydrological inputs from direct precipitation and overland runoff from adjacent areas within the VPZ and rear lot drainage as necessary to maintain the existing water balance;
- The downstream reach of the Tributary of One Mile Creek on the Subject Lands, which provides Type 3 (Marginal), indirect fish habitat and was classified as requiring Conservation under the HDFA, will be left in place and protected with a 10 m buffer, which will be enhanced through restoration vegetation plantings. No transition grading will be required within the buffer;
- Hydrology within the Tributary of One Mile Creek, which may be important to maintain downstream direct fish habitat in One Mile Creek (off the Subject Lands) will be maintained through continued conveyance of off-site drainage and on-site stormwater management measures;
- An Erosion and Sedimentation Control Plan, Stormwater Management Plan and Accidental Spills Response Plan will be required as part of the detailed design to ensure no indirect impacts on fish habitat in the watercourse downstream from the Subject Lands as a result of the proposed works; and
- No development will occur within the Greenbelt Plan area that provides a potential ecological linkage between adjacent natural features. Minor transition grading encroachment of up to 2 m into the area will occur. Woodland restoration measures and/or vegetation protection zone plantings adjacent to the woodland area are anticipated to result in long-term enhancement to the ecological linkage function of this area of the Subject Lands. Some short-term disruption to wildlife use of the linkage may occur during the construction period.

Considering the above, and as discussed within the accompanying Impact Assessment table, the development of the Subject Lands can be completed without negative impact on the natural heritage features and associated functions. Conceptual planning for opportunities to provide a net gain, or overall benefit to the local natural heritage have been presented.

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**SAVANTA INC.**

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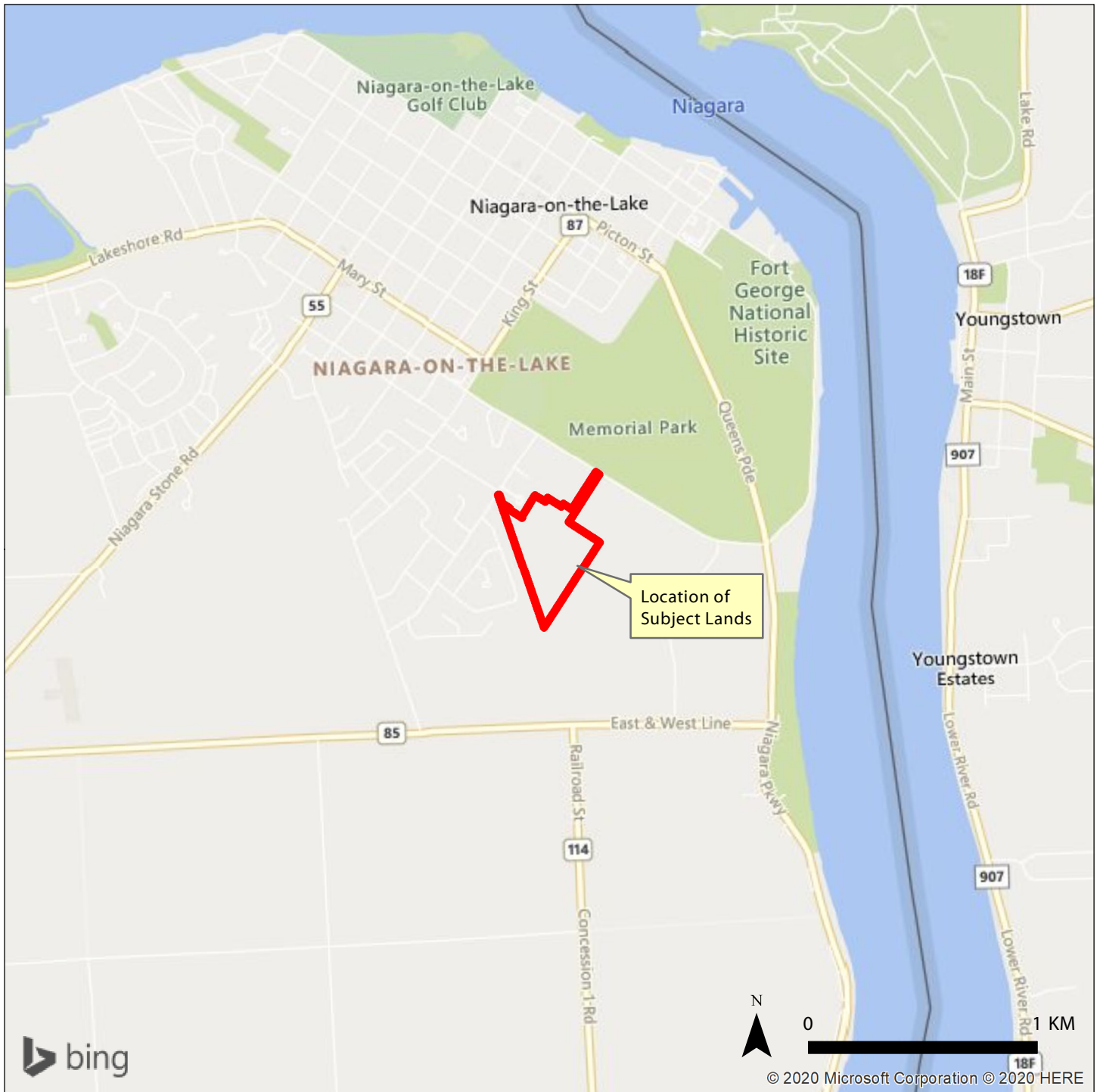
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**APPENDICES**

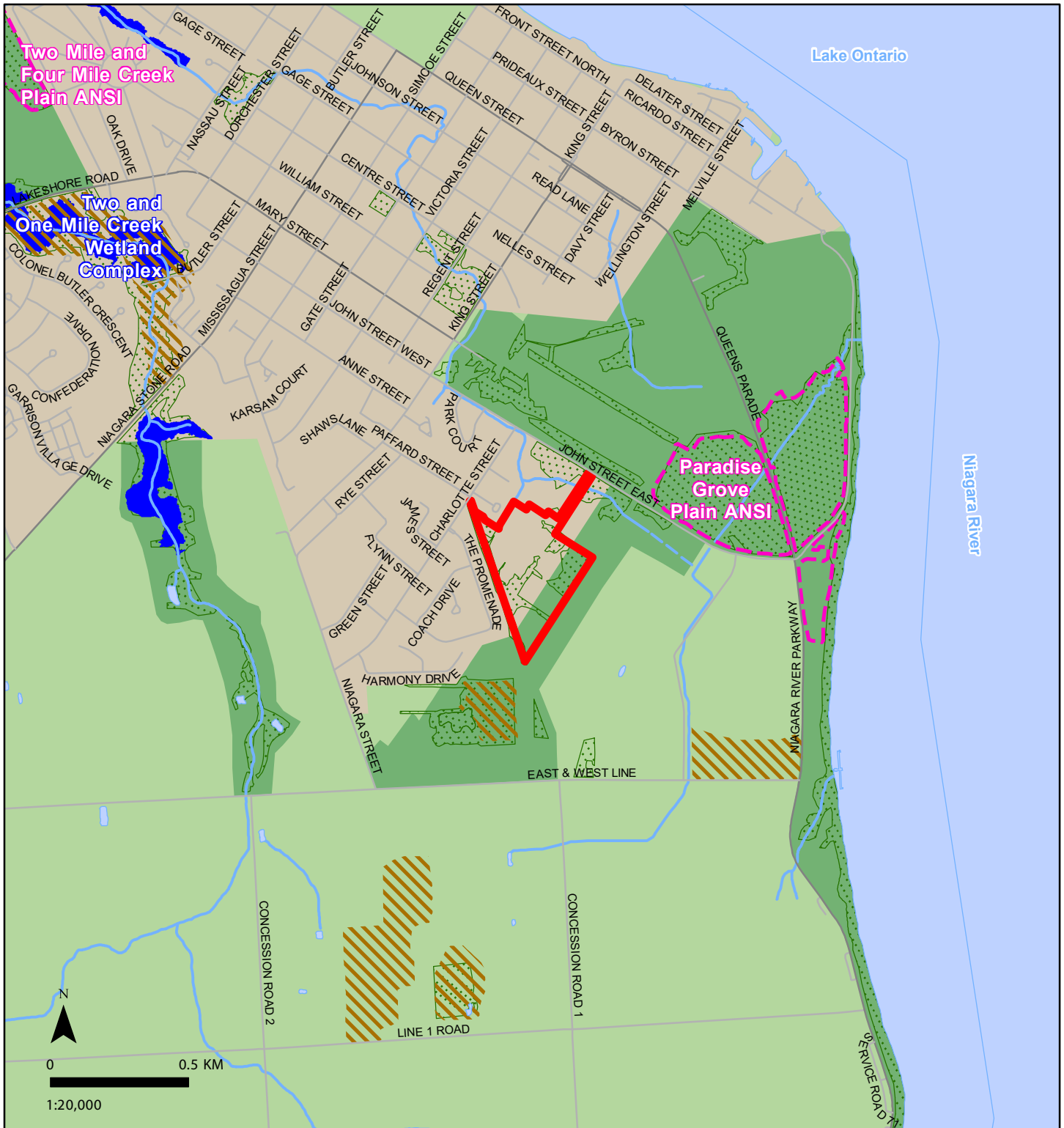
## **Appendix A – Figures**



200 John St. & 588 Charlotte Street, NOTL

Figure 1  
Location of Subject Lands











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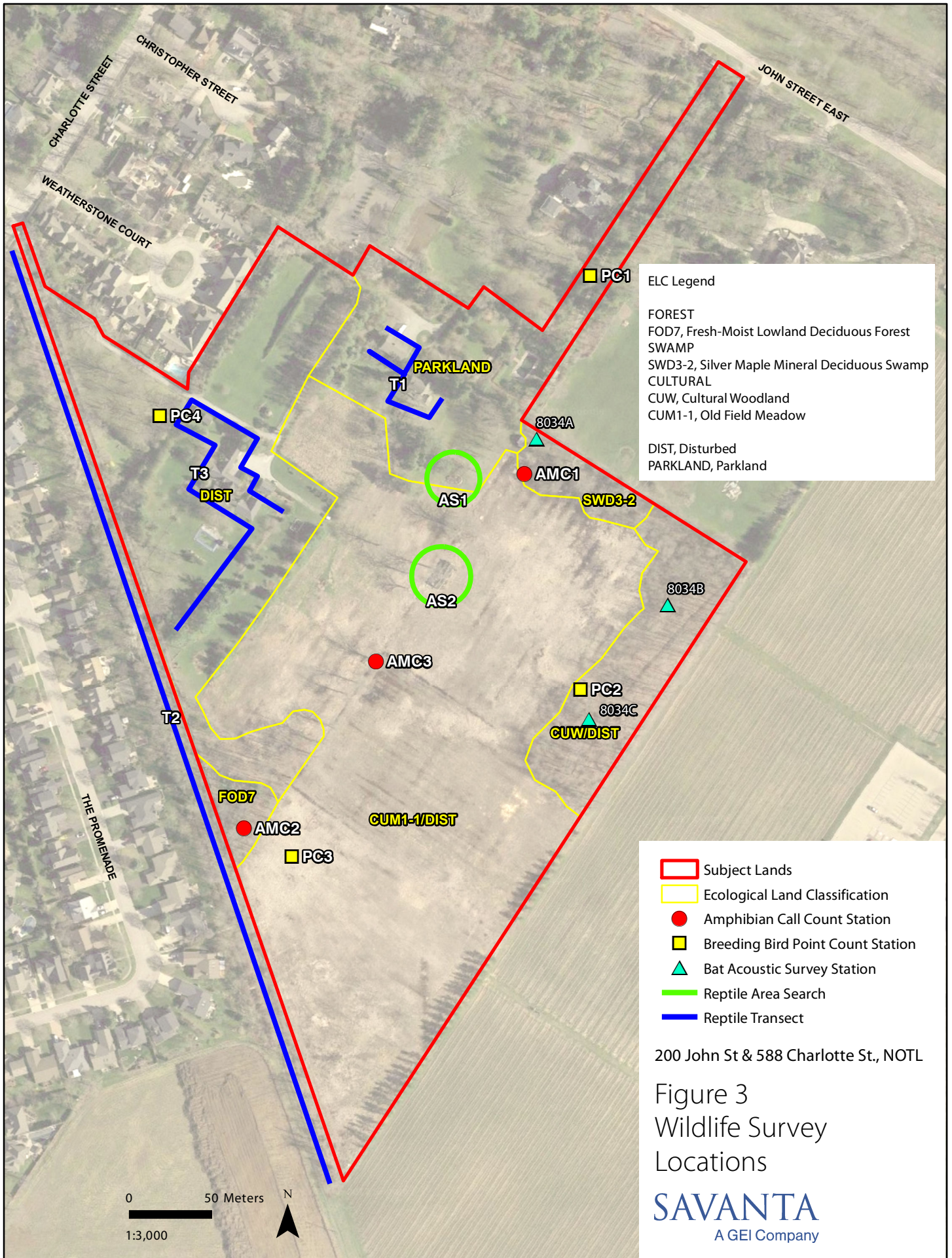
200 John St. & 588 Charlotte St., NOTL

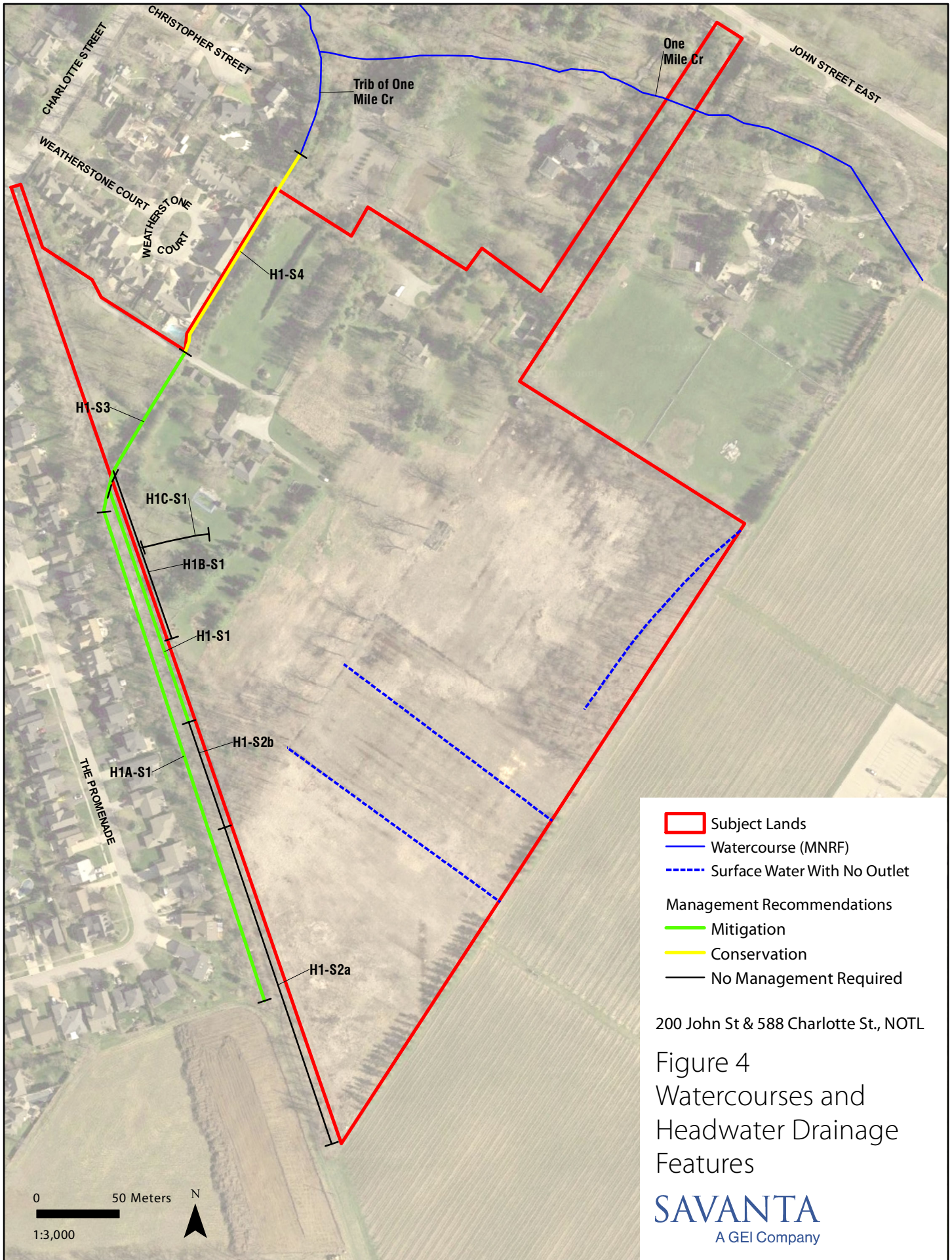
## Figure 2 Landscape Setting

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- |   |                        |  |   |
|---|------------------------|--|---|
|  | Subject Lands          |  | Wetland Evaluated-Provincial (MNRF LIO) |
|  | ANSI (MNRF LIO)        |  | Woodland (MNRF LIO)                     |
|  | Waterbody (MNRF LIO)   |  | Deer Wintering Area (MNRF LIO)          |
|  | Watercourse (MNRF LIO) |  | Greenbelt Towns and Villages            |
|   |                        |  | Greenbelt Protected Countryside         |
|   |                        |  | Greenbelt Natural Heritage System       |

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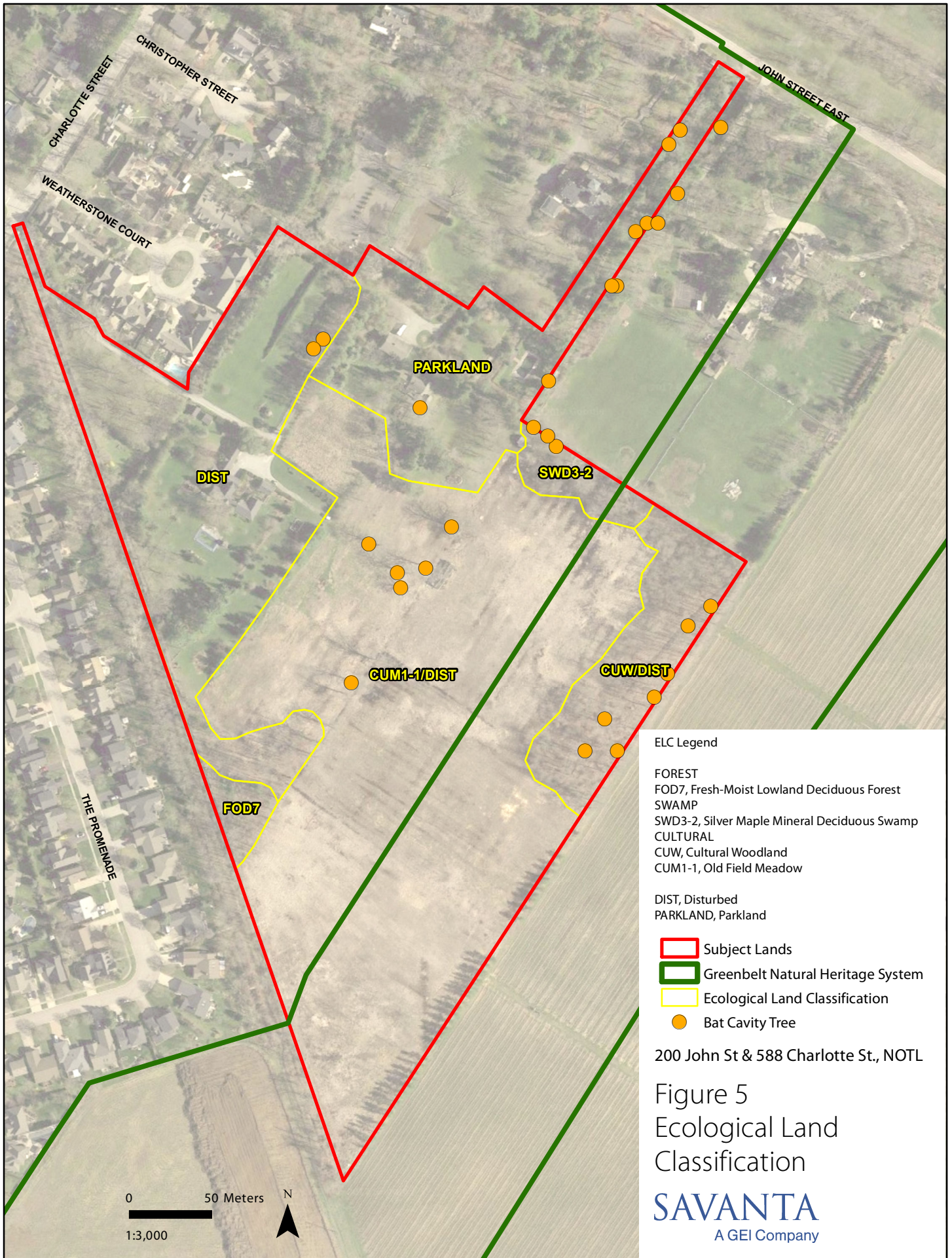


- Subject Lands
- Watercourse (MNRF)
- Surface Water With No Outlet
- Management Recommendations
- Mitigation
- Conservation
- No Management Required

200 John St & 588 Charlotte St., NOTL

Figure 4  
Watercourses and  
Headwater Drainage  
Features





ELC Legend

FOREST  
 FOD7, Fresh-Moist Lowland Deciduous Forest  
 SWAMP  
 SWD3-2, Silver Maple Mineral Deciduous Swamp  
 CULTURAL  
 CUW, Cultural Woodland  
 CUM1-1, Old Field Meadow

DIST, Disturbed  
 PARKLAND, Parkland

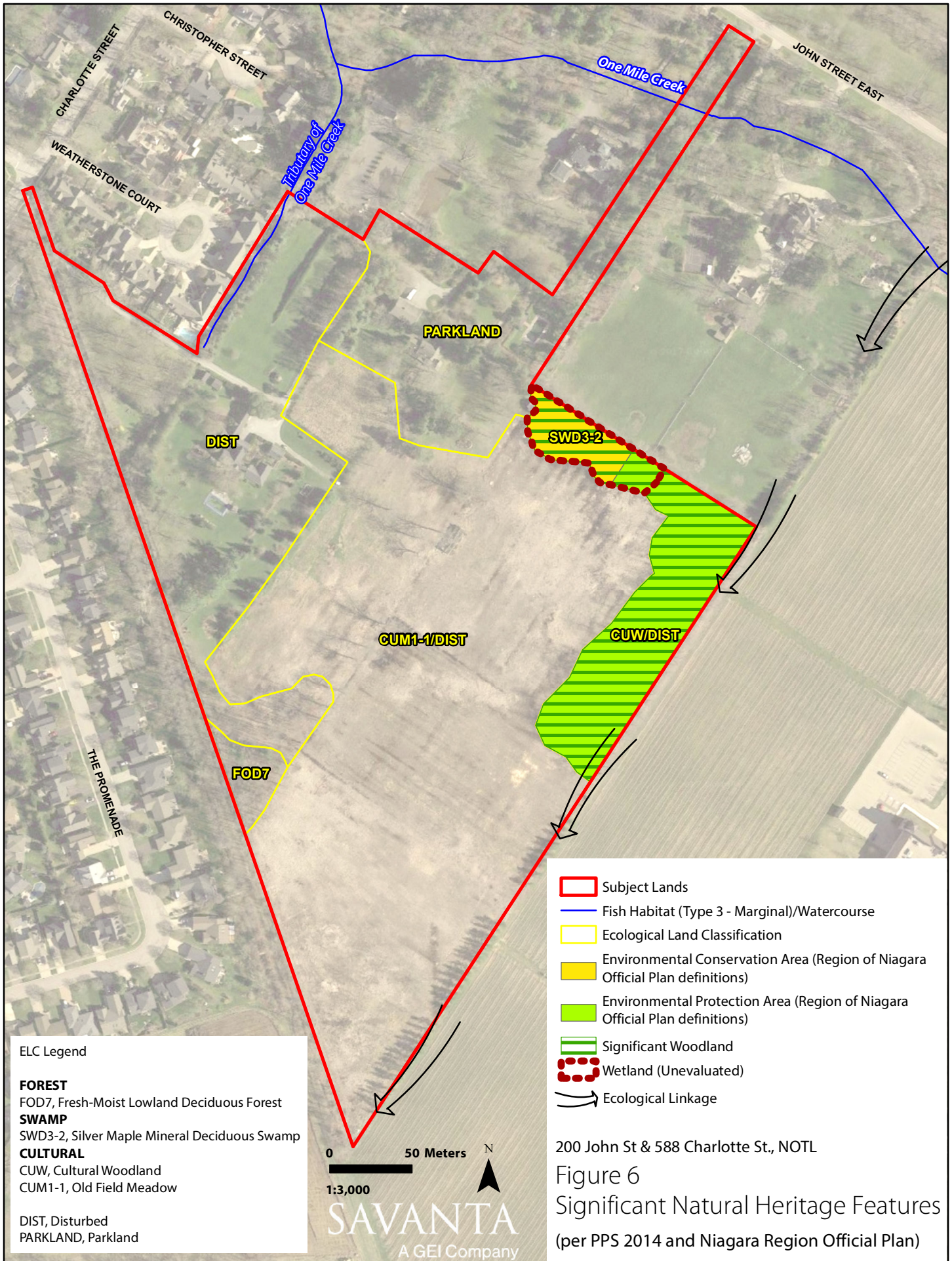
Subject Lands  
 Greenbelt Natural Heritage System  
 Ecological Land Classification  
 Bat Cavity Tree

200 John St & 588 Charlotte St., NOTL

Figure 5  
 Ecological Land  
 Classification







ELC Legend

**FOREST**

FOD7, Fresh-Moist Lowland Deciduous Forest

**SWAMP**

SWD3-2, Silver Maple Mineral Deciduous Swamp

**CULTURAL**

CUW, Cultural Woodland

CUM1-1, Old Field Meadow

DIST, Disturbed

PARKLAND, Parkland



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- Subject Lands
- Fish Habitat (Type 3 - Marginal)/Watercourse
- Ecological Land Classification
- Environmental Conservation Area (Region of Niagara Official Plan definitions)
- Environmental Protection Area (Region of Niagara Official Plan definitions)
- Significant Woodland
- Wetland (Unevaluated)
- Ecological Linkage

200 John St & 588 Charlotte St., NOTL

Figure 6  
 Significant Natural Heritage Features  
 (per PPS 2014 and Niagara Region Official Plan)



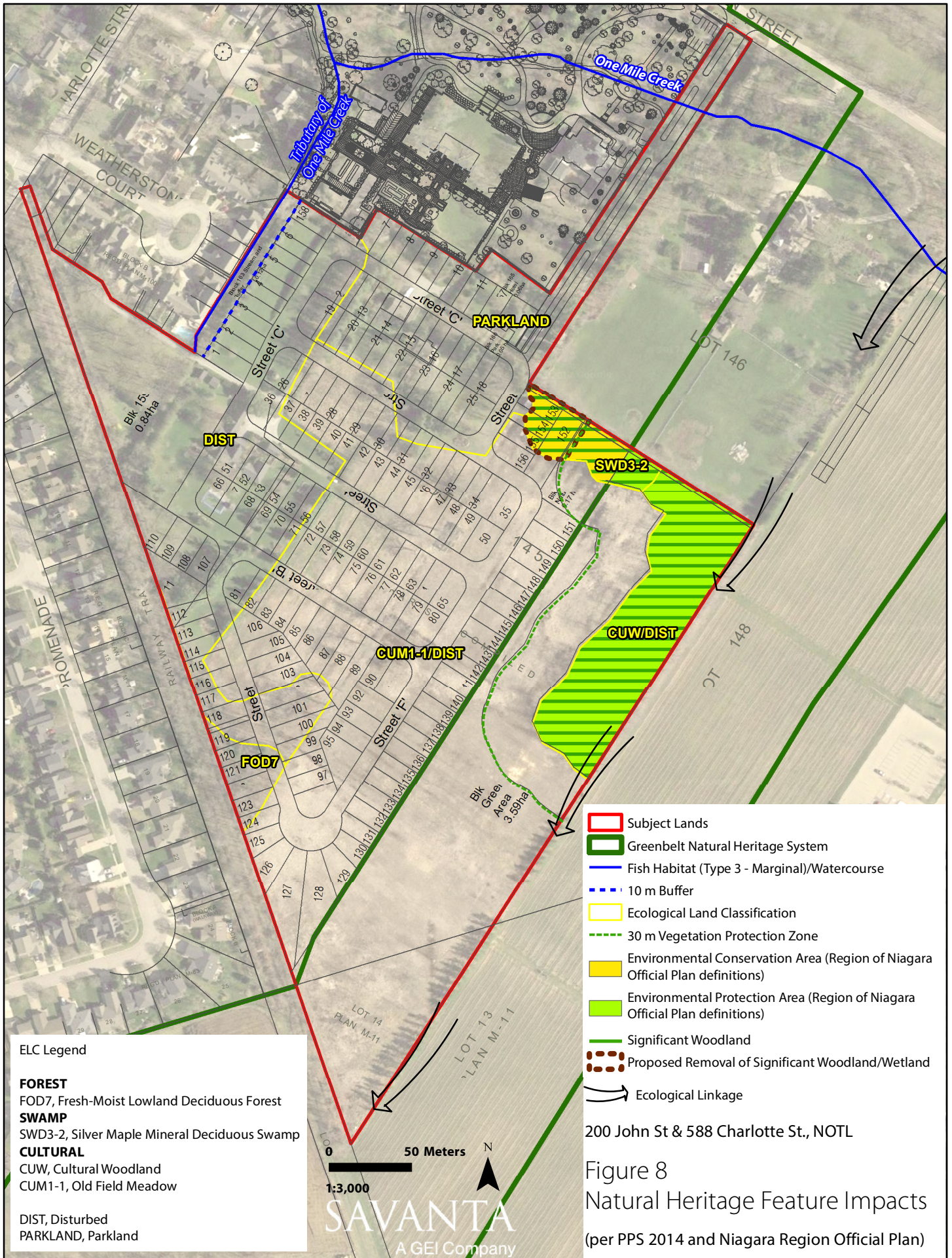
200 John St & 588 Charlotte St., NOTL

## Figure 7 Proposed Concept Development Plan

- Subject Lands
- Greenbelt Natural Heritage System

Concept Plan: SGL Planning & Design Inc.  
2020-06-29\_Draft\_Plan.dwg (July 8, 2020)

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**Appendix B - Tables**

**Table 1: Savanta Field Studies and Natural Inventories (2018)**

<b>FIELD DATE</b>	<b>NATURE OF INVESTIGATION</b>	<b>SURVEYOR(S)</b>
March 23	<ul style="list-style-type: none"> <li>• Site Reconnaissance</li> <li>• Bat Habitat Assessment</li> </ul>	M. Green J. Leslie
April 13	<ul style="list-style-type: none"> <li>• Headwater Drainage Feature Assessment (Round 1)</li> </ul>	M. Green N. Boucher
May 1	<ul style="list-style-type: none"> <li>• Snake Transect Survey (Round 1)</li> </ul>	M. Green N. Boucher
May 1	<ul style="list-style-type: none"> <li>• Amphibian Call Count and Egg Mass Survey (Round 1)</li> </ul>	M. Green
May 14	<ul style="list-style-type: none"> <li>• Snake Transect Survey (Round 2)</li> </ul>	M. Green R. Rossi
May 17	<ul style="list-style-type: none"> <li>• Snake Transect Survey (Round 3)</li> </ul>	M. Green
May 23	<ul style="list-style-type: none"> <li>• Amphibian Call Count (Round 2)</li> </ul>	M. Green
May 30	<ul style="list-style-type: none"> <li>• Headwater Drainage Feature Assessment (Round 2)</li> </ul>	M. Green L. Williamson
June 7	<ul style="list-style-type: none"> <li>• Breeding Bird Survey (Round 1)</li> </ul>	B. Charlton
June 12	<ul style="list-style-type: none"> <li>• Amphibian Call Count (Round 3)</li> </ul>	M. Green
June 25	<ul style="list-style-type: none"> <li>• Breeding Bird Survey (Round 2)</li> </ul>	B. Charlton
July 4	<ul style="list-style-type: none"> <li>• Breeding Bird Survey (Round 3)</li> </ul>	B. Charlton
July 9	<ul style="list-style-type: none"> <li>• Ecological Land Classification and Botanical Inventory</li> </ul>	C. Zoladeski
September 14	<ul style="list-style-type: none"> <li>• Headwater Drainage Feature Assessment (Round 3)</li> </ul>	M. Green
October 17	<ul style="list-style-type: none"> <li>• Fall Botanical Inventory</li> </ul>	C. Zoladeski
November 21	<ul style="list-style-type: none"> <li>• Late Fall Botanical Inventory</li> </ul>	C. Zoladeski

**Table 2: Bat Acoustic Survey Dates and Conditions**

SURVEYORS (SURNAME, INITIAL)	SURVEY ROUND	DATE (2018)	TIME		EQUIPMENT USED	AIR TEMP (c°)	HUMIDITY (%)	CLOUD COVER (%)	BEAUFORT WIND SPEED	PRECIPITATION	MOON PHASE
			START	END							
Williamson, L. Green, M.	1	MA31	21:00	5:30	SM3/SM4	20	74	N/A	2	None	Waning Gibbous (97%)
Williamson, L. Green, M.	2	JU01	21:00	5:30	SM3/SM4	22	79	N/A	2	None	Waning Gibbous (92%)
Williamson, L. Green, M.	3	JU02	21:00	5:30	SM3/SM4	10	70	N/A	2	None	Waning Gibbous (86%)
Williamson, L. Green, M.	4	JU03	21:00	5:30	SM3/SM4	16	82	N/A	1	None	Waning Gibbous (79%)
Williamson, L. Green, M.	5	JU04	21:00	5:30	SM3/SM4	15	77	N/A	2	None	Waning Gibbous (71%)
Williamson, L. Green, M.	6	JU05	21:00	5:30	SM3/SM4	11	76	N/A	2	None	Waning Gibbous (62%)
Williamson, L. Green, M.	7	JU06	21:00	5:30	SM3/SM4	13	73	N/A	1	None	Last Quarter (53%)
Williamson, L. Green, M.	8	JU07	21:00	5:30	SM3/SM4	17	73	N/A	1	None	Waning Crescent (43%)
Williamson, L. Green, M.	9	JU08	21:00	5:30	SM3/SM4	17	61	N/A	1	None	Waning Crescent (33%)

**Table 2: Bat Acoustic Survey Dates and Conditions**

SURVEYORS (SURNAME, INITIAL)	SURVEY ROUND	DATE (2018)	TIME		EQUIPMENT USED	AIR TEMP (c°)	HUMIDITY (%)	CLOUD COVER (%)	BEAUFORT WIND SPEED	PRECIPITATION	MOON PHASE
			START	END							
Williamson, L. Green, M.	10	JU09	21:00	5:30	SM3/SM4	16	67	N/A	1	None	Waning Crescent (23%)
Williamson, L. Green, M.	11	JU10	21:00	5:30	SM3/SM4	17	54	N/A	1	None	Waning Crescent (15%)
Williamson, L. Green, M.	12	JU11	21:00	5:30	SM3/SM4	16	56	N/A	1	None	Waning Crescent (23%)

**LEGEND:**

BEAUFORT WIND SPEED SCALE	
1	Calm (<1 km/hr)
2	Light Air (1-5 km/hr)
3	Light Breeze (6-11 km/hr)
4	Gentle Breeze (12-19 km/hr)
5	Moderate Breeze (20-28 km/hr)

MONTH (CODE)	
JA	January
FB	February
MR	March
AP	April
MA	May
JU	June
JL	July
AU	August
SE	September
OC	October
NO	November
DE	December

**Table 3: Headwater Drainage Feature Classifications and Management Recommendations**

HDF Reach	Step 1		Step 2 Riparian	Step 3 Fish Habitat	Step 4 Terrestrial Habitat	Management Recommendation (Based on TRCA and CVC 2014)	Final Management Recommendation
	Hydrology	Modifiers					
H1-S1	Round 1 FC: 4 Round 2 FC: 2 Round 3 FC: 1  FT: 2 (Channelized)  <b>Valued</b> – Feature was dry during the final assessment period	This feature consists of an anthropogenic ditch. Agricultural operations, a pedestrian walking trail to the west and recent vegetation clearing have likely modified the hydrology of this feature.	<b>Important</b> – Riparian vegetation consists of scrubland in the first corridor category (0-1.5 m) and lawn in the latter corridor categories (1.5-10 m and 10-30 m).	<b>Contributing</b> – No direct fish habitat present in feature.	<b>Limited</b> – No terrestrial habitat present in feature. No link to breeding habitat.	<b>Conservation</b> – Based on presence of scrubland associated with the pedestrian trail adjacent to the Subject Lands.	<b>Mitigation</b> – Actual ecological and biophysical value of anthropogenic ditch is low and removal should be considered viable, subject to hydrological Mitigation to maintain downstream flows in Tributary of One Mile Creek. However, Feature is located off the Subject Lands and will therefore not be altered.
H1A-S1	Round 1 FC: 4 Round 2 FC: 2 Round 3 FC: 1  FT: 2 (Channelized)  <b>Valued</b> – Feature was dry during the final assessment period	This feature consists of an anthropogenic ditch. Adjacent residential development and pedestrian walking trail to the west have likely modified the hydrology of this feature.	<b>Important</b> – Riparian vegetation consists of scrubland in the first two corridor categories (0-1.5 m and 1.5-10 m) and lawn in the third corridor category (10-30 m).	<b>Contributing</b> – No direct fish habitat present in feature.	<b>Limited</b> – No terrestrial habitat present in feature. No link to breeding habitat.	<b>Conservation</b> – Based on presence of scrubland associated with the pedestrian trail adjacent to the Subject Lands.	<b>Mitigation</b> – Actual ecological and biophysical value of anthropogenic ditch is low and removal should be considered viable, subject to hydrological Mitigation to maintain downstream flows in Tributary of One Mile Creek. However, Feature is located off the Subject Lands and will therefore not be altered.
H1B-S1	Round 1 FC: 1 Round 2 FC: 1 Round 3 FC: 1  FT: 7 (Swale)  <b>Limited</b> – Swale with no flow during any of the assessment periods	Historical vegetation clearing, residential development and lawn maintenance have likely modified the hydrology of this feature.	<b>Contributing</b> – Riparian vegetation consists of lawn in all corridor categories except the first corridor category (0-1.5 m) to the west, which contains of a narrow cultural hedgerow.	<b>Contributing</b> – No direct fish habitat present in feature.	<b>Limited</b> – No terrestrial habitat present in feature. No link to breeding habitat.	<b>No Management Required</b>	<b>No Management Required</b>
H1C-S1	Round 1 FC: 1 Round 2 FC: 1 Round 3 FC: 1  FT: 7 (Swale)  <b>Limited</b> – Swale with no flow during any of the flow assessment periods	Historical vegetation clearing, residential development and lawn maintenance have likely modified the hydrology of this feature.	<b>Contributing</b> – Riparian vegetation consists of lawn in all corridor categories.	<b>Contributing</b> – No direct fish habitat present in feature.	<b>Limited</b> – No terrestrial habitat present in feature. No link to breeding habitat.	<b>No Management Required</b>	<b>No Management Required</b>
H1-S2a	Round 1 FC: 1 Round 2 FC: 1 Round 3 FC: 1  FT: 2 (Channelized)  <b>Limited</b> – Dry during the first round assessment	Agricultural operations and a pedestrian walking trail to the west have likely modified the hydrology of this feature.	<b>Limited</b> – Riparian vegetation consists of cropped land in all corridor categories.	<b>Contributing</b> – No direct fish habitat present in feature.	<b>Limited</b> – No terrestrial habitat present in feature. No link to breeding habitat.	<b>No Management Required</b>	<b>No Management Required</b>



**Table 3: Headwater Drainage Feature Classifications and Management Recommendations**

HDF Reach	Step 1		Step 2 Riparian	Step 3 Fish Habitat	Step 4 Terrestrial Habitat	Management Recommendation (Based on TRCA and CVC 2014)	Final Management Recommendation
	Hydrology	Modifiers					
H1-S2b	Round 1 FC: 1 Round 2 FC: 2 Round 3 FC: 1  FT: 2 (Channelized)  <b>Limited</b> – Dry during the first round assessment			<b>Contributing</b> – No direct fish habitat present in feature.	<b>Limited</b> – No terrestrial habitat present in feature. No link to breeding habitat.	<b>No Management Required</b>	<b>No Management Required</b>
H1-S3	Round 1 FC: 4 Round 2 FC: 1 Round 3 FC: 1  FT: 2 (Channelized)  <b>Contributing</b> – Feature was dry during the second and final assessment periods; provides ephemeral flow	Historical vegetation clearing, residential development and lawn maintenance have likely modified the hydrology of this feature.	<b>Contributing</b> – Riparian vegetation consists of lawn in all corridor categories.	<b>Contributing</b> – No direct fish habitat present in feature.	<b>Limited</b> – No terrestrial habitat present in feature. No link to breeding habitat.	<b>Conservation</b> – Based on upstream reaches (H1-S1 and H1A-S1) having a management recommendation of Conservation (i.e., downstream reaches cannot have a less restrictive recommendation). On the basis of reach-specific observations, this reach would only warrant Mitigation.	<b>Mitigation</b> – Feature is an anthropogenic excavated ditch, primarily receiving flows from upstream ditches along the pedestrian trail. Ecological and biophysical value of the reach is considered to be low. Mitigation to maintain downstream hydrological contributions to One Mile Creek.
H1-S4	Round 1 FC: 4 Round 2 FC: 1 Round 3 FC: 1  FT: 2 (Channelized)  <b>Contributing</b> – Feature was dry during the second and final assessment periods; provides ephemeral flow	Historical vegetation clearing, residential development and lawn maintenance have likely modified the hydrology of this feature.	<b>Contributing</b> – Riparian vegetation consists of lawn in all corridor categories.	<b>Contributing</b> – No direct fish habitat present in feature.	<b>Limited</b> – No terrestrial habitat present in feature. No link to breeding habitat.	<b>Conservation</b> – Based on upstream reaches (H1-S1 and H1A-S1) having a management recommendation of Conservation (i.e., downstream reaches cannot have a less restrictive recommendation). On the basis of reach-specific observations, this reach would only warrant Mitigation.	<b>Conservation</b> – Reach warrants maintenance as an open-channel feature and is anticipated to be regulated by NPCA.

**Legend**

FC – Flow Condition Codes from Ontario Stream Assessment Protocol (Gorenz and Stanfield 2017)  
 1 – No surface Water (dry)  
 2 – Standing Water  
 3 – Interstitial Flow

4 – Surface Flow Minimal (<0.5 L/s)  
 5 – Surface Flow Substantial (>0.5 L/s)

FT – Feature Type Codes from Ontario Stream Assessment Protocol (Gorenz and Stanfield 2017)  
 1 – Defined Natural Channel      6 – Wetland  
 2 – Channelized                      7 – Swale  
 3 – Multi-thread                      8 – Roadside Ditch  
 4 – No Defined Feature              9 – Online Pond Outlet  
 5 – Tiled Drainage

**Table 4: Ecological Land Classification Community Types**

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC 2013)
<b>FOREST</b>		
<b>Deciduous Forest</b>		
<b>FOD7</b> Fresh-Moist Lowland Deciduous Forest	<ul style="list-style-type: none"> <li>• Young remnant stand composed of many tree species with no evident dominant.</li> <li>• Most interior trees are smaller in size, with larger ones at the edge.</li> <li>• Canopy species include Green Ash (<i>Fraxinus pennsylvanica</i>), Pin Oak (<i>Quercus palustris</i>), Swamp White Oak (<i>Q. bicolor</i>), Red Oak (<i>Q. rubra</i>), Black Walnut (<i>Juglans nigra</i>) and White Pine (<i>Pinus strobus</i>).</li> <li>• Well developed understorey with Multiflora Rose (<i>Rosa multiflora</i>), Riverbank Grape (<i>Vitis riparia</i>), Grey Dogwood (<i>Cornus foemina</i>), Starved Aster (<i>Symphotrichum lateriflorum</i>), Enchanter's Nightshade (<i>Circaea lutetiana</i>) and White Avens (<i>Geum canadense</i>).</li> </ul>	NA
<b>SWAMP</b>		
<b>Deciduous Swamp</b>		
<b>SW3-2</b> Silver Maple Mineral Deciduous Swamp	<ul style="list-style-type: none"> <li>• Small stand of Silver Maple (<i>Acer saccharinum</i>), with associates of Green Ash, Pin Oak and Swamp White Oak.</li> <li>• Grey dogwood is the leading tall shrub.</li> <li>• Herbaceous layer composed of Straw Sedge (<i>Carex tenera</i>), followed by Reed-canary Grass (<i>Phalaris arundinacea</i>) and Fowl Meadow Grass (<i>Poa palustris</i>).</li> </ul>	S5
<b>CULTURAL</b>		
<b>CUW</b> Cultural Woodland	<ul style="list-style-type: none"> <li>• Open, narrow woodland of Swamp White Oak, Pin Oak, Green Ash, Trembling Aspen (<i>Populus tremuloides</i>), Shagbark Hickory (<i>Carya ovata</i>) and White Oak (<i>Quercus alba</i>).</li> <li>• The understorey has been recently cleared, but it consisted of Multiflora Rose, Tartarian Honeysuckle (<i>Lonicera tatarica</i>), Tall Goldenrod (<i>Solidago altissima</i>), White Avens, Kentucky Bluegrass (<i>Poa pratensis</i>), Garlic Mustard (<i>Alliaria petiolata</i>), and many others.</li> </ul>	NA
<b>CUM1-1</b> Old Field Meadow	<ul style="list-style-type: none"> <li>• Open field covered by regenerating vegetation of mostly weeds and other exotics, for example Orchard Grass (<i>Dactylis glomerata</i>), Redtop (<i>Agrostis gigantea</i>), English Plantain (<i>Plantago lanceolata</i>), St. John's-wort (<i>Hypericum perforatum</i>), Red Clover (<i>Trifolium</i></li> </ul>	NA

**Table 4: Ecological Land Classification Community Types**

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC 2013)
	<i>pratense</i> , New England Aster ( <i>Symphotrichum novae-angliae</i> ), Horseweed ( <i>Conyza canadensis</i> ), Hemp Dogbane ( <i>Apocynum cannabinum</i> ) and Tall Goldenrod ( <i>Solidago altissima</i> ).	

Latin Name	Latin Synonym	Common Name	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank	Local Status Niagara	Authority
										Oldham 2010	
<b>Dryopteridaceae</b>		<b>Wood Fern Family</b>									
<i>Matteuccia struthiopteris</i> var. <i>pensylvanica</i>		Ostrich Fern	5	-3		S5			G5T5	C	(L.) Tod.
<b>Cupressaceae</b>		<b>Cedar Family</b>									
<i>Thuja occidentalis</i>		Eastern White Cedar	4	-3		S5			G5	U	L.
<b>Pinaceae</b>		<b>Pine Family</b>									
<i>Picea abies</i>		Norway Spruce		5	-1	SNA			G5	IC	(L.) Karsten
<i>Picea glauca</i>		White Spruce	6	3		S5			G5	IU	(Moench) Voss
<i>Pinus nigra</i>		Austrian Pine		-5	-1	SNA			GNA	IR	Arnold
<i>Pinus strobus</i>		Eastern White Pine	4	3		S5			G5	C	L.
<i>Pinus sylvestris</i>		Scots Pine		5	-3	SNA			GNA	IC	L.
<i>Tsuga canadensis</i>		Eastern Hemlock	7	3		S5			G5	C	(L.) Carrière
<b>Aceraceae</b>		<b>Maple Family</b>									
<i>Acer negundo</i>		Manitoba Maple	0	-2		S5			G5	C	L.
<i>Acer platanoides</i>		Norway Maple		5	-3	SNA			GNA	IC	L.
<i>Acer pseudoplatanus</i>		Sycamore Maple		5	-1	SNA			GNA	IR	L.
<i>Acer saccharinum</i>		Silver Maple	5	-3		S5			G5	C	L.
<i>Acer saccharum</i> ssp. <i>saccharum</i>		Sugar Maple	4	3		S5			G5T5	C	Marshall
<b>Amaranthaceae</b>		<b>Amaranth Family</b>									
<i>Amaranthus retroflexus</i>		Red-root Amaranth		2	-1	SNA			G5	IC	L.
<b>Anacardiaceae</b>		<b>Sumac or Cashew Family</b>									
<i>Rhus typhina</i>		Staghorn Sumac	1	5		S5			G5	C	L.
<i>Toxicodendron radicans</i> ssp. <i>negundo</i>	<i>Rhus radicans</i> ssp. <i>negundo</i>	Climbing Poison Ivy	5	-1		S5			G5T5	C	L.
<b>Apiaceae</b>		<b>Carrot or Parsley Family</b>									
<i>Aegopodium podagraria</i>		Goutweed		0	-3	SNA			GNR	IR	L.
<i>Daucus carota</i>		Wild Carrot		5	-2	SNA			GNR	IC	L.
<b>Apocynaceae</b>		<b>Dogbane Family</b>									
<i>Apocynum cannabinum</i> var. <i>cannabinum</i>		Hemp Dogbane		1		S5			G5T5	C	L.
<b>Asclepiadaceae</b>		<b>Milkweed Family</b>									
<i>Asclepias syriaca</i>		Common Milkweed	0	5		S5			G5	C	L.
<b>Asteraceae</b>		<b>Composite or Aster Family</b>									
<i>Ambrosia artemisiifolia</i>		Annual Ragweed	0	3		S5			G5	C	L.
<i>Bidens frondosa</i>		Devil's Beggaticks	3	-3		S5			G5	C	L.
<i>Cirsium arvense</i>		Canada Thistle		3	-1	SNA			GNR	IC	(L.) Scop.
<i>Cirsium vulgare</i>		Bull Thistle		4	-1	SNA			GNR	IC	(Savi) Ten.
<i>Conyza canadensis</i>	<i>Erigeron canadensis</i>	Horseweed	0	1		S5			G5	C	(L.) Cronquist
<i>Erechtites hieraciifolius</i>		Eastern Burnweed	2	3		S5			G5	C	(L.) Raf. ex DC.
<i>Erigeron annuus</i>		Annual Fleabane				S5			G5	C	(L.) Pers.

Table 5: Vascular Plant List

Latin Name	Latin Synonym	Common Name	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank	Local Status Niagara	Authority
										Oldham 2010	
<i>Erigeron philadelphicus ssp. philadelphicus</i>		Philadelphia Fleabane	1	-3		S5			G5T5	C	L.
<i>Erigeron strigosus</i>		Daisy Fleabane	0	1		S5			G5	R	Muhlenb. ex Willd.
<i>Eurybia macrophylla</i>	<i>Aster macrophyllus</i>	Large-leaved Aster	5	5		S5			G5	C	L.
<i>Euthamia graminifolia</i>	<i>Solidago graminifolia</i>	Grass-leaved Goldenrod	2	-2		S5			G5	C	(L.) Nutt.
<i>Galinsoga quadriradiata</i>		Fringed Galinsoga		5	-1	SNA			GNR	IR	Rúz, Lopez & Pavón
<i>Lactuca serriola</i>		Prickly Lettuce		0	-1	SNA			GNR	IC	L.
<i>Lapsana communis</i>		Common Nipplewort		5	-2	SNA			GNR	IC	L.
<i>Leucanthemum vulgare</i>	<i>Chrysanthemum leucanthemum</i>	Oxeye Daisy		5	-1	SNA			GNR	IC	L.
<i>Rudbeckia laciniata</i>		Cut-leaved Coneflower	7	-4		S5			G5	R	L.
<i>Senecio vulgaris</i>		Common Ragwort		5	-1	SNA			GNR	IU	L.
<i>Solidago altissima</i>		Tall Goldenrod	1	3		S5			G5	C	L.
<i>Sonchus arvensis ssp. arvensis</i>		Field Sow-thistle				SNA			GNR	IC	L.
<i>Sonchus asper</i>		Prickly Sow-thistle		0	-1	SNA			GNR	IC	(L.) Hill
<i>Symphotrichum lanceolatum var. lanceolatum</i>	<i>Aster lanceolatus ssp. lanceolatus</i>	White Panicked Aster	3	-3		S5			G5T5	C	Willd.
<i>Symphotrichum lateriflorum</i>	<i>Aster lateriflorus</i>	Starved Aster	3	-2		S5			G5	C	(L.) Britton
<i>Symphotrichum novae-angliae</i>	<i>Aster novae-angliae</i>	New England Aster	2	-3		S5			G5	C	L.
<i>Taraxacum officinale</i>		Common Dandelion		3	-2	SNA			G5	IC	G. Weber
<b>Balsaminaceae</b>		<b>Touch-me-not Family</b>									
<i>Impatiens capensis</i>		Spotted Jewelweed	4	-3		S5			G5	C	Meerb.
<b>Berberidaceae</b>		<b>Barberry Family</b>									
<i>Berberis thunbergii</i>		Japanese Barberry		4	-3	SNA			GNR	IC	DC.
<i>Berberis vulgaris</i>		European Barberry		3	-2	SNA			GNR	IC	L.
<i>Podophyllum peltatum</i>		May Apple	5	3		S5			G5	C	L.
<b>Betulaceae</b>		<b>Birch Family</b>									
<i>Ostrya virginiana</i>		Eastern Hop-hornbeam	4	4		S5			G5	C	(Miller) K. Koch
<b>Boraginaceae</b>		<b>Borage Family</b>									
<i>Myosotis scorpioides</i>		True Forget-me-not		0	-1	SNA			G5	IU	L.
<b>Brassicaceae</b>		<b>Mustard Family</b>									
<i>Alliaria petiolata</i>	<i>Alliaria officinalis</i>	Garlic Mustard		0	-3	SNA			GNR	IC	(M. Bieb.) Cavara & Grande
<i>Sinapis arvensis</i>	<i>Brasica kaber</i>	Corn Mustard		5	-1	SNA			GNR	IR	L.
<b>Campanulaceae</b>		<b>Bellflower Family</b>									
<i>Campanula rapunculoides</i>		Creeping Bellflower		5	-2	SNA			GNR	IR	L.
<b>Caprifoliaceae</b>		<b>Honeysuckle Family</b>									
<i>Lonicera tatarica</i>		Tartarian Honeysuckle		3	-3	SNA			GNR	IC	L.
<i>Viburnum lantana</i>		Wayfaring-tree		5	-1	SNA			GNR	IU	L.
<i>Viburnum opulus</i>		Cranberry Viburnum		0	-1	S5			G5	IC	L.
<b>Caryophyllaceae</b>		<b>Pink Family</b>									

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Latin Name	Latin Synonym	Common Name	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank	Local Status Niagara	Authority
										Oldham 2010	
<i>Cerastium fontanum</i>	<i>Cerastium vulgatum</i>	Common Mouse-ear Chickweed		3	-1	SNA			GNR	IC	Baumg.
<i>Dianthus armeria</i>		Deptford-pink		5	-1	SNA			GNR	IC	L.
<b>Celastraceae</b>		<b>Staff-tree Family</b>									
<i>Celastrus orbiculatus</i>		Oriental Bittersweet		5	-1	SNA			GNR	IR	Thunb.
<b>Chenopodiaceae</b>		<b>Goosefoot Family</b>									
<i>Chenopodium album</i> var. <i>album</i>	<i>Chenopodium album</i>	White Goosefoot		1	-1	SNA			G5TNR	IC	L.
<b>Cornaceae</b>		<b>Dogwood Family</b>									
<i>Cornus alternifolia</i>		Alternate-leaf Dogwood	6	5		S5			G5	C	L. f.
<i>Cornus foemina</i>	<i>Cornus racemosa</i>	Grey Dogwood	2	-2		S5			GNR	C	Miller
<b>Euphorbiaceae</b>		<b>Spurge Family</b>									
<i>Acalypha rhomboidea</i>		Three-seeded Mercury	0	3		S5			G5	C	L.
<i>Euphorbia maculata</i>	<i>Chamaesyce maculata</i>	Spotted Spurge		4	-1	SNA			G5?	IU	(L.) Small
<b>Fabaceae</b>		<b>Pea Family</b>									
<i>Cercis canadensis</i>		Eastern Redbud	8	3		SX			G5	IR	L.
<i>Gleditsia triacanthos</i>		Honey-locust	3	0		S2?			G5	R	L.
<i>Medicago lupulina</i>		Black Medic		1	-1	SNA			GNR	IC	L.
<i>Trifolium hybridum</i>		Alsike Clover		1	-1	SNA			GNR	IC	L.
<i>Trifolium pratense</i>		Red Clover		2	-2	SNA			GNR	IC	L.
<b>Fagaceae</b>		<b>Beech Family</b>									
<i>Fagus sylvatica</i>		European Beech									L.
<i>Quercus alba</i>		White Oak	6	3		S5			G5	C	L.
<i>Quercus bicolor</i>		Swamp White Oak	8	-4		S4			G5	C	Willd.
<i>Quercus macrocarpa</i>		Bur Oak	5	1		S5			G5	U	Michx.
<i>Quercus palustris</i>		Pin Oak	9	-3		S4			G5	C	Muenchh.
<i>Quercus robur</i>		English Oak				SNA			GNR		L.
<i>Quercus rubra</i>		Northern Red Oak	6	3		S5			G5		L.
<i>Quercus velutina</i>		Black Oak	8	5		S4			G5	U	Lam.
<b>Gentianaceae</b>		<b>Gentian Family</b>									
<i>Centaurium erythraea</i>	<i>Centaurium umbellatum</i>	Common Centaury		-4	-1	SNA			GNR	IH	Rafn.
<b>Geraniaceae</b>		<b>Geranium Family</b>									
<i>Geranium robertianum</i>		Herb-robert		5	-2	SNA			G5	IC	L.
<b>Grossulariaceae</b>		<b>Currant Family</b>									
<i>Ribes rubrum</i>		Northern Red Currant		5	-2	SNA			G4G5	IC	L.
<b>Guttiferae</b>		<b>St. John's-wort Family</b>									
<i>Hypericum perforatum</i>		Common St. John's-wort		5	-3	SNA			GNR	IC	L.
<b>Hippocastanaceae</b>		<b>Buckeye Family</b>									

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										Oldham 2010	
<i>Aesculus glabra</i>		Ohio Buckeye	10	-1		S1			G5	IR	Willd.
<b>Juglandaceae</b>		<b>Walnut Family</b>									
<i>Carya cordiformis</i>		Bitternut hickory	6	0		S5			G5	C	(Wangenh.) K. Koch
<i>Carya ovata</i>		Shagbark Hickory	6	3		S5			G5	C	(Miller) K. Koch
<i>Juglans nigra</i>		Black Walnut	5	3		S4?			G5	C	L.
<b>Lamiaceae</b>		<b>Mint Family</b>									
<i>Glechoma hederacea</i>		Ground Ivy		5	-2	SNA			GNR	IC	L.
<i>Lycopus uniflorus</i>		Northern Bugleweed	5	-5		S5			G5	C	Michx.
<i>Melissa officinalis</i>		Garden Balm		5	-1	SNA			GNR	IR	L.
<i>Nepeta cataria</i>		Catnip		1	-2	SNA			GNR	IC	L.
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>		Self-heal		0	-1	SNA			G5TU		L.
<b>Malvaceae</b>		<b>Mallow Family</b>									
<i>Malva neglecta</i>		Dwarf Cheeseweed		5	-1	SNA			GNR	IU	Wallr.
<b>Menispermaceae</b>		<b>Moonseed Family</b>									
<i>Menispermum canadense</i>		Canada Moonseed	7	0		S4			G5	U	L.
<b>Moraceae</b>		<b>Mulberry Family</b>									
<i>Morus alba</i>		White Mulberry		0	-3	SNA			GNR	IC	L.
<b>Oleaceae</b>		<b>Olive Family</b>									
<i>Fraxinus pennsylvanica</i>		Red Ash	3	-3		S5			G5	C	Marshall
<i>Ligustrum vulgare</i>		European Privet		1	-2	SNA			GNR	IC	L.
<b>Onagraceae</b>		<b>Evening-primrose Family</b>									
<i>Circaea lutetiana</i>	<i>Circaea canadensis</i> <i>ssp. canadensis</i>	Enchanter's Nightshade	3	3		S5			G5	C	L.
<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>		Hairy Willow-herb	3	3		S5			G5T5	C	Raf.
<i>Epilobium parviflorum</i>		Small-flower Willow-herb		3	-1	SNA			GNR	IU	Schreb.
<b>Oxalidaceae</b>		<b>Wood Sorrel Family</b>									
<i>Oxalis stricta</i>		Upright Yellow Wood-sorrel	0	3		S5			G5	C	L.
<b>Phytolaccaceae</b>		<b>Pokeweed Family</b>									
<i>Phytolacca americana</i>		Common Pokeweed	3	1		S4			G5	C	L.
<b>Plantaginaceae</b>		<b>Plantain Family</b>									
<i>Plantago lanceolata</i>		English Plantain		0	-1	SNA			G5	IC	L.
<i>Plantago major</i>		Common Plantain		-1	-1	SNA			G5	IC	L.
<b>Polygonaceae</b>		<b>Smartweed Family</b>									
<i>Persicaria maculosa</i>	<i>Polygonum persicaria</i>	Lady's-thumb		-3	-1	SNA			G3G5	IC	L.
<i>Persicaria virginiana</i>	<i>Polygonum virginianum</i>	Virginia Knotweed	6	0		S4			G5	C	L.
<i>Rumex crispus</i>		Curly Dock		-1	-2	SNA			GNR	IC	L.

Table 5: Vascular Plant List

Latin Name	Latin Synonym	Common Name	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank	Local Status Niagara	Authority
										Oldham 2010	
<i>Rumex obtusifolius</i>		Bitter Dock		-3	-1	SNA			GNR	IU	L.
<b>Primulaceae</b>		<b>Primrose Family</b>									
<i>Lysimachia nummularia</i>		Moneywort		-4	-3	SNA			GNR	IC	L.
<b>Ranunculaceae</b>		<b>Buttercup Family</b>									
<i>Ranunculus acris</i>		Tall Buttercup			-2	SNA			G5	IC	L.
<b>Rhamnaceae</b>		<b>Buckthorn Family</b>									
<i>Rhamnus cathartica</i>		Common Buckthorn		3	-3	SNA			GNR	IC	L.
<b>Rosaceae</b>		<b>Rose Family</b>									
<i>Agrimonia gryposepala</i>		Tall Hairy Groovebur	2	2		S5			G5	C	Wallr.
<i>Crataegus monogyna</i>		English Hawthorn		5	-1	SNA			G5		Jacq.
<i>Crataegus species</i>		Hawthorn species									
<i>Fragaria virginiana</i>		Virginia Strawberry	2	1		S5			G5	C	Miller
<i>Geum canadense</i>		White Avens	3	0		S5			G5	C	Jacq.
<i>Physocarpus opulifolius</i>		Ninebark	5	-2		S5			G5		(L.) Maxim.
<i>Potentilla simplex</i>		Old-field Cinquefoil	3	4		S5			G5	C	Michx.
<i>Prunus avium</i>		Sweet Cherry		5	-2	SNA			GNR	IC	(L.) L.
<i>Prunus serotina</i>		Black Cherry	3	3		S5			G5	C	Ehrh.
<i>Rosa multiflora</i>		Multiflora Rose		3	-3	SNA			GNR	IC	Thunb. ex Murray
<i>Rubus occidentalis</i>		Black Raspberry	2	5		S5			G5	C	L.
<b>Rubiaceae</b>		<b>Madder Family</b>									
<i>Asperula arvensis</i>		Blue Woodruff				SNA			G5		L.
<b>Salicaceae</b>		<b>Willow Family</b>									
<i>Populus deltoides</i> ssp. <i>deltoides</i>		Eastern Cottonwood	4	-1		S5			G5T5	C	Bartram ex Marshall
<i>Populus tremuloides</i>		Trembling Aspen		0		S5			G5	C	Michx.
<i>Salix x rubens</i>		Reddish Willow		-4	-3	SNA			GNA		Schrank
<b>Scrophulariaceae</b>		<b>Figwort Family</b>									
<i>Verbascum blattaria</i>		Moth Mullein		4	-1	SNA			GNR	IU	L.
<i>Verbascum thapsus</i>		Common Mullein		5	-2	SNA			GNR	IC	L.
<b>Simaroubaceae</b>		<b>Ailanthus Family</b>									
<i>Ailanthus altissima</i>		Tree-of-heaven		5	-1	SNA			GNR	IR	(Miller) Swingle
<b>Solanaceae</b>		<b>Nightshade Family</b>									
<i>Solanum dulcamara</i>		Climbing Nightshade		0	-2	SNA			GNR	IC	L.
<b>Tiliaceae</b>		<b>Linden Family</b>									
<i>Tilia americana</i>		American Basswood	4	3		S5			G5	C	L.
<i>Tilia cordata</i>		Small Leaf Linden				SNA			GNR	IH	Miller
<b>Ulmaceae</b>		<b>Elm Family</b>									



Table 5: Vascular Plant List

Latin Name	Latin Synonym	Common Name	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank	Local Status Niagara	Authority
										Oldham 2010	
<i>Ulmus americana</i>		White Elm	3	-2		S5			G5	C	L.
<b>Verbenaceae</b>											
<b>Vervain Family</b>											
<i>Verbena urticifolia</i>		White Vervain	4	-1		S5			G5	C	L.
<b>Violaceae</b>											
<b>Violet Family</b>											
<i>Viola sororia</i>	<i>Viola sororia</i> var. <i>affinis</i>	Woolly Blue Violet				S5			G5	C	Willd.
<b>Vitaceae</b>											
<b>Grape Family</b>											
<i>Parthenocissus inserta</i>	<i>Parthenocissus vitacea</i>	Inserted Virginia-creeper	3	3		S5			G5	C	(A. Kern.) Fritsch
<i>Vitis riparia</i>		Riverbank Grape	0	-2		S5			G5	C	Michx.
<b>Cyperaceae</b>											
<b>Sedge Family</b>											
<i>Carex bromoides</i>		Bromelike Sedge	7	-4		S5			G5	C	Schkuhr ex Willd.
<i>Carex cristatella</i>		Crested Sedge	3	-4		S5			G5	U	Britton
<i>Carex gracillima</i>		Graceful Sedge	4	3		S5			G5	C	Schwein.
<i>Carex radiata</i>		Eastern Star Sedge	4	5		S5			G5	C	(Wahlenb.) Small
<i>Carex stipata</i>		Awl-fruited Sedge	3	-5		S5			G5	C	Muhlenb. ex Willd.
<i>Carex tenera</i>		Straw Sedge	4	-1		S5			G5	C	Dewey
<i>Carex vulpinoidea</i>		Fox Sedge	3	-5		S5			G5	C	Michx.
<i>Scirpus pendulus</i>		Lined Bulrush	3	-5		S5			G5	U	Muhlenb. ex Willd.
<b>Juncaceae</b>											
<b>Rush Family</b>											
<i>Juncus dudleyi</i>		Dudley's Rush	1	0		S5			G5	C	Wiegelb
<i>Juncus effusus</i> var. <i>effusus</i>	<i>Juncus effusus</i> var. <i>solutus</i> , <i>Juncus effusus</i>	Soft Rush	4	-5		SNA			GNR	C	L.
<i>Juncus tenuis</i>		Path Rush	0	0		S5			G5	C	Willd.
<b>Liliaceae</b>											
<b>Lily Family</b>											
<i>Asparagus officinalis</i>		Garden Asparagus		3	-1	SNA			G5?	IC	L.
<i>Hemerocallis fulva</i>		Orange Day-lily		5	-3	SNA			GNA	IC	(L.) L.
<b>Poaceae</b>											
<b>Grass Family</b>											
<i>Agrostis gigantea</i>		Redtop		0	-2	SNA			G4G5	IC	Roth
<i>Agrostis stolonifera</i>		Redtop		-3		S5			G5	C	L.
<i>Dactylis glomerata</i>		Orchard Grass		3	-1	SNA			GNR	IC	L.
<i>Digitaria ischaemum</i>		Small Crabgrass		3	-1	SNA			GNR	IU	(Schreb. ex Schwein.) Schreb. ex Muhlenb.
<i>Elymus repens</i>		Quack Grass		3	-3	SNA			GNR	IC	(L.) Gould
<i>Festuca rubra</i> ssp. <i>rubra</i>		Red Fescue		1	-1	SNA			G5T5	IC	L.
<i>Glyceria grandis</i>		Tall Mannagrass	5	-5		S5			G5	C	S. Watson
<i>Glyceria striata</i>		Fowl Meadow Grass	3	-5		S5			G5	C	(Lam.) A. Hitchc.
<i>Panicum capillare</i>		Witch Grass	0	0		S5			G5	C	L.
<i>Phalaris arundinacea</i> var. <i>arundinacea</i>	<i>Phalaris arundinacea</i>	Reed Canary Grass	0	-4		S5			GNR	C	L.
<i>Phleum pratense</i>		Timothy		3	-1	SNA			GNR	IC	L.
<i>Phragmites australis</i> ssp. <i>australis</i>		European Reed				SNR			GNR		(Cav.) Trin. ex Steud.

Latin Name	Latin Synonym	Common Name	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank	Local Status Niagara	Authority
										Oldham 2010	
<i>Poa compressa</i>		Canada Blue Grass	0	2		SNA			GNR	IC	L.
<i>Poa palustris</i>		Fowl Meadow Grass	5	-4		S5			G5	C	L.
<i>Poa pratensis ssp. pratensis</i>		Kentucky Bluegrass	0	1		SNA			G5T5	IC	L.
<i>Schedonorus pratensis</i>	<i>Festuca pratensis,</i> <i>Lolium pratense</i>	Meadow Fescue		4	-1	SNA			G5	IC	Hudson
<i>Setaria pumila</i>	<i>Setaria glauca</i>	Yellow Foxtail		0	-1	SNA			GNR	IC	(Poir.) Schult.

**STATISTICS**

**Species Richness**

Total Number of Species:	162	
Native Species:	84	52%
Exotic Species:	78	48%
S1-S3 Species:	2	2%
S4 Species:	7	8%
S5 Species:	74	89%

**Floristic Quality Indices**

Mean Co-efficient of Conservatism (CC)	3.6	
CC 0 - 3 = lowest sensitivity	42	52%
CC 4 - 6 = moderate sensitivity	30	37%
CC 7 - 8 = high sensitivity	7	9%
CC 9 - 10 = highest sensitivity	2	2%
Floristic Quality Index (FQI)	32	

**Weedy and Invasive Species**

Mean Weediness Index:	-1.6	
-1 = low potential invasiveness	39	56%
-2 = moderate potential invasiveness	17	24%
-3 = high potential invasiveness	14	20%

**Wetland Species**

Mean Wetness Index	1.1	
upland	32	21%
facultative upland	44	29%
facultative	40	26%
facultative wetland	29	19%
obligate wetland	8	5%

Table 6: Master Wildlife List

COMMON NAME	SCIENTIFIC NAME	SPECIES GROUPS	PROVINCIAL STATUS (S RANK)	GLOBAL STATUS (G RANK)	SARO (Provincial)	COSEWIC (FEDERAL)	LOCAL STATUS HALTON	LOCAL STATUS HAMILTON	LOCAL STATUS TRCA	REGIONAL STATUS (REGION OF WATERLOO)	LOCAL STATUS CVC
American Toad	<i>Anaxyrus americanus</i>	AMPHIBIAN	S5	G5					L4	X	
Mourning Dove	<i>Zenaidra macroura</i>	BIRD	S5	G5					L5		
American Goldfinch	<i>Spinus tristis</i>	BIRD	S5B	G5					L5		
Song Sparrow	<i>Melospiza melodia</i>	BIRD	S5B	G5					L5		
American Robin	<i>Turdus migratorius</i>	BIRD	S5B	G5					L5		
Blue Jay	<i>Cyanocitta cristata</i>	BIRD	S5	G5					L5		
Eastern Wood-Pewee	<i>Contopus virens</i>	BIRD	S4B	G5	SC	SC			L4		
Hairy Woodpecker	<i>Picoides villosus</i>	BIRD	S5	G5					L4	X	
European Starling	<i>Sturnus vulgaris</i>	BIRD	SNA	G5					L+		
Ring-billed Gull	<i>Larus delawarensis</i>	BIRD	S5B,S4N	G5					L4		
Gray Catbird	<i>Dumetella carolinensis</i>	BIRD	S4B	G5					L4		
Northern Cardinal	<i>Cardinalis cardinalis</i>	BIRD	S5	G5					L5		
Downy Woodpecker	<i>Picoides pubescens</i>	BIRD	S5	G5					L5		
Carolina Wren	<i>Thryothorus ludovicianus</i>	BIRD	S4	G5			HR		L4	X	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	BIRD	S4	G5					L5		
Common Grackle	<i>Quiscalus quiscula</i>	BIRD	S5B	G5					L5		
House Wren	<i>Troglodytes aedon</i>	BIRD	S5B	G5					L5		
Killdeer	<i>Charadrius vociferus</i>	BIRD	S5B, S5N	G5					L4		
Northern Flicker	<i>Colaptes auratus</i>	BIRD	S4B	G5					L4		
Baltimore Oriole	<i>Icterus galbula</i>	BIRD	S4B	G5					L5		
Great Blue Heron	<i>Ardea herodias</i>	BIRD	S4	G5					L3	X	
Chimney Swift	<i>Chaetura pelagica</i>	BIRD	S4B, S4N	G5	THR	THR	HU		L4		
Warbling Vireo	<i>Vireo gilvus</i>	BIRD	S5B	G5					L5	X	
House Sparrow	<i>Passer domesticus</i>	BIRD	SNA	G5					L+		
Barn Swallow	<i>Hirundo rustica</i>	BIRD	S4B	G5	THR	THR			L4		
American Crow	<i>Corvus brachyrhynchos</i>	BIRD	S5B	G5					L5		
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	BIRD	S4	G5			HU		L4	X	
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	BIRD	S4B	G5					L4		
Black-capped Chickadee	<i>Poecile atricapillus</i>	BIRD	S5	G5					L5		
Savannah Sparrow	<i>Passerculus sandwichensis</i>	BIRD	S4B	G5					L4		
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	BIRD	S5B	G5					L2		
Sandhill Crane	<i>Grus canadensis</i>	BIRD	S5B	G5						X	
White-breasted Nuthatch	<i>Sitta carolinensis</i>	BIRD	S5	G5					L4		
House Finch	<i>Carpodacus mexicanus</i>	BIRD	SNA	G5					L+		
Monarch	<i>Danaus plexippus</i>	BUTTERFLIES	S4B, S2N	G4	SC	END					
Eastern Cottontail	<i>Sylvilagus floridanus</i>	MAMMAL	S5	G5					L4		
Deer Mouse	<i>Peromyscus maniculatus</i>	MAMMAL	S5	G5					L4		
Red Squirrel	<i>Tamiasciurus hudsonicus</i>	MAMMAL	S5	G5					L4		
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	MAMMAL	S5	G5					L5		
Big Brown Bat	<i>Eptesicus fuscus</i>	MAMMAL	S4	G5					L4		
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	MAMMAL	S4	G3G4				H			
Hoary Bat	<i>Lasiurus borealis</i>	MAMMAL	S4	G3G4					LX		

COMMON NAME	SCIENTIFIC NAME	SPECIES GROUPS	PROVINCIAL STATUS (S RANK)	GLOBAL STATUS (G RANK)	SARO (Provincial)	COSEWIC (FEDERAL)	LOCAL STATUS HALTON	LOCAL STATUS HAMILTON	LOCAL STATUS TRCA	REGIONAL STATUS (REGION OF WATERLOO)	LOCAL STATUS CVC
Eastern Red Bat	<i>Lasiurus cinereus</i>	MAMMAL	S4	G3G4					LX		
Little Brown Bat	<i>Myotis lucifugus</i>	MAMMAL	S4	G3G4	END	END			L4		
Small-footed Myotis	<i>Myotis leibii</i>	MAMMAL	S2S3	G4	END						

#### Explanation of Status and Acronyms

SARO: Species at Risk in Ontario List (O.Reg. 230/08; August 1, 2018)  
COSEWIC: Committee on the Status of Endangered Wildlife in Canada  
S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)  
S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),  
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)  
S4: Apparently Secure—Uncommon but not rare  
S5: Secure—Common, widespread, and abundant in the province  
SX: Presumed extirpated  
SH: Possibly Extirpated (Historical)  
SNR: Unranked  
SU: Unrankable—Currently unrankable due to lack of information  
SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities.  
S#S#: Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species  
S#B- Breeding status rank  
S#N- Non Breeding status rank  
?: Indicates uncertainty in the assigned rank  
G1: Extremely rare globally; usually fewer than 5 occurrences in the overall range  
G1G2: Extremely rare to very rare globally  
G2: Very rare globally; usually between 5-10 occurrences in the overall range  
G2G3: Very rare to uncommon globally  
G3: Rare to uncommon globally; usually between 20-100 occurrences  
G3G4: Rare to common globally  
G4: Common globally; usually more than 100 occurrences in the overall range  
G4G5: Common to very common globally  
G5: Very common globally; demonstrably secure  
GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.  
T: Denotes that the rank applies to a subspecies or variety  
Q: Denotes that the taxonomic status of the species, subspecies, or variety is questionable.  
END: Endangered  
THR: Threatened  
SC: Special Concern  
NAR: Not At Risk  
IND: Indeterminant, insufficient information to assign status  
DD: Data Deficient  
6: Rare in Site Region 6  
7: Rare in Site Region 7

Area: Minimum patch size for area-sensitive species (ha)  
H- highly significant in Hamilton Region (i.e. rare)  
m- moderately significant in Hamilton Region (i.e. uncommon)  
L1- extremely rare locally (Toronto Region)  
L2- very rare locally (Toronto Region)  
L3- rare to uncommon locally (Toronto Region)  
HR- rare in Halton Region, highly significant  
HU- uncommon in Halton Region, moderately significant

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**Table 7: Breeding Bird Survey Results**

Common Name	Scientific Name	Species Order	Species Family	Provincial Status (S Rank)	Global Status (G Rank)	COSSARO (MNRF)	COSEWIC (Federal)	Highest Breeding Evidence
Mourning Dove	<i>Zenaida macroura</i>	Columbiformes	Columbidae	S5	G5			PR-T
European Starling	<i>Sturnus vulgaris</i>	Passeriformes	Mimidae	SNA	G5			CO-CF
Ring-billed Gull	<i>Larus delawarensis</i>	Charadriiformes	Laridae	S5B,S4N	G5			OB-X
Carolina Wren	<i>Thryothorus ludovicianus</i>	Passeriformes	Troglodytidae	S4	G5			PR-T
Gray Catbird	<i>Dumetella carolinensis</i>	Passeriformes	Mimidae	S4B	G5			CO-CF
Northern Cardinal	<i>Cardinalis cardinalis</i>	Passeriformes	Cardinalidae	S5	G5			CO-CF
Song Sparrow	<i>Melospiza melodia</i>	Passeriformes	Emberizidae	S5B	G5			CO-CF
American Goldfinch	<i>Spinus tristis</i>	Passeriformes	Fringillidae	S5B	G5			PR-P
Eastern Wood-Pewee	<i>Contopus virens</i>	Passeriformes	Tyrannidae	S4B	G5	SC	SC	PO-S
Blue Jay	<i>Cyanocitta cristata</i>	Passeriformes	Corvidae	S5	G5			CO-FY
American Robin	<i>Turdus migratorius</i>	Passeriformes	Turdidae	S5B	G5			CO-FY
Downy Woodpecker	<i>Picoides pubescens</i>	Piciformes	Picidae	S5	G5			PR-T
Hairy Woodpecker	<i>Picoides villosus</i>	Piciformes	Picidae	S5	G5			PR-T
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Passeriformes	Icteridae	S4	G5			PR-P
House Wren	<i>Troglodytes aedon</i>	Passeriformes	Troglodytidae	S5B	G5			PR-T
Killdeer	<i>Charadrius vociferus</i>	Charadriiformes	Charadriidae	S5B, S5N	G5			CO-FY
Common Grackle	<i>Quiscalus quiscula</i>	Passeriformes	Icteridae	S5B	G5			CO-FS
Northern Flicker	<i>Colaptes auratus</i>	Piciformes	Picidae	S4B	G5			CO-CF
Baltimore Oriole	<i>Icterus galbula</i>	Passeriformes	Icteridae	S4B	G5			CO-CF
Barn Swallow	<i>Hirundo rustica</i>	Passeriformes	Hirundinidae	S4B	G5	THR	THR	OB-X
Chimney Swift	<i>Chaetura pelagica</i>	Apodiformes	Apodidae	S4B, S4N	G5	THR	THR	OB-X
American Crow	<i>Corvus brachyrhynchos</i>	Passeriformes	Corvidae	S5B	G5			OB-X
Great Blue Heron	<i>Ardea herodias</i>	Pelecaniformes	Ardeidae	S4	G5			OB-X
Warbling Vireo	<i>Vireo gilvus</i>	Passeriformes	Vireonidae	S5B	G5			PO-S
House Sparrow	<i>Passer domesticus</i>	Passeriformes	Passeridae	SNA	G5			PR-P
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Passeriformes	Tyrannidae	S4B	G5			PO-S
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Piciformes	Picidae	S4	G5			PO-S
Black-capped Chickadee	<i>Poecile atricapillus</i>	Passeriformes	Paridae	S5	G5			PO-H

**Table 7: Breeding Bird Survey Results**

Common Name	Scientific Name	Species Order	Species Family	Provincial Status (S Rank)	Global Status (G Rank)	COSSARO (MNRF)	COSEWIC (Federal)	Highest Breeding Evidence
Savannah Sparrow	<i>Passerculus sandwichensis</i>	Passeriformes	Emberizidae	S4B	G5			PO-S
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Suliformes	Phalacrocoracidae	S5B	G5			OB-X
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Passeriformes	Sittidae	S5	G5			PO-S
Sandhill Crane	<i>Grus canadensis</i>	Gruiformes	Gruidae	S5B	G5			OB-X
House Finch	<i>Carpodacus mexicanus</i>	Passeriformes	Fringillidae	SNA	G5			PR-T

**Species Common Name and Scientific Name:**

Consistent with the American Ornithologists' Union. 2016. 57th Check-list Supplement of North American Birds. Accessed November 30, 2016. Available online: <http://americanornithology.org/content/aou-checklist-north-and-middle-american-birds-7th-edition-and-supplements/>

**Species Code:**

Consistent with the American Ornithologists' Union. 2016. Species 4-Letter-Codes. Accessed May 25, 2012. Available online: [www.birdsontario.org/atlas/codes.jsp?lang=en&pg=species/](http://www.birdsontario.org/atlas/codes.jsp?lang=en&pg=species/)

**Highest Breeding Evidence:**

Codes assigned for breeding evidence are consistent with the Ontario Breeding Bird Atlas (OBBA). 2012. Breeding Evidence Codes. Accessed January 25, 2014. Available online: <http://www.birdsontario.org/dataentry/codes.jsp?page=breeding/>. Several different types of breeding evidence are often recorded for any given species over the course of surveys - this table reports only the highest level of breeding evidence

**S ranks:**

Provincial ranks are from the Natural Heritage Information Centre; S1 (critically imperiled), S2 (imperiled), S3 (vulnerable), S4 (apparently secure), S5 (secure); ranks were updated using NHIC species list 2016

**G ranks:**

Global ranks are from the Natural Heritage Information Centre; G1 (extremely rare), G2 (very rare), G3 (rare to uncommon), G4 (common), G5 (very common); ranks were updated using NHIC species list 2016

**COSSARO (MNRF):**

Ontario Species at Risk as listed by the Committee on the Status of Species at Risk in Ontario (from NHIC Table October 2013 and updates posted on Ontario Regulation 230/08 Species at Risk in Ontario website as of September 19, 2016: <https://www.ontario.ca/laws/regulation/080230/>); END - Endangered, THR - Threatened, SC - Special Concern, NAR - Not at Risk

**COSEWIC:**

Assessed Species at Risk at the national level as listed by the Committee on the Status of Endangered Wildlife in Canada (from COSEWIC September 19, 2016: [http://www.cosewic.gc.ca/eng/sct1/searchform\\_e.cfm/](http://www.cosewic.gc.ca/eng/sct1/searchform_e.cfm/)); END - Endangered, THR - Threatened, SC - Special Concern, NAR - Not at Risk

**Table 8: Cavity Density Survey Results from the Subject Lands**

<b>Community Type</b>	<b>Approx. Area Size (Ha)</b>	<b># Of Cavity Trees (Observed at <math>\geq 25</math>cm DBH)</b>	<b># Of Cavity Trees (Observed <math>\geq 10</math> and <math>&lt; 25</math> Cm DBH)</b>	<b>Density (<math>\geq 10</math> Cavity Trees/Ha At <math>\geq 25</math> Cm DBH)</b>
HR/RES	0.4	9	0	N/A
RES	3.57	4	0	N/A
CUM	6.51	6	0	N/A
CUW/SWD	1.08	10	0	9.3



**Table 9: Bat Acoustic Survey Results**

SM3 Monitoring Station	ELC Community	Low Frequency Calls					High Frequency Calls							Total	
		Hoary Bat	Big Brown Bat	Silver-haired Bat	Unidentified Calls	Total Low Frequency Calls	Eastern Red Bat	Eastern Small-footed Myotis	Northern Myotis	Little Brown Myotis	Tri-colored Bat	Unidentified Calls with Myotis characteristics	Unidentified Calls without Myotis characteristics		Total High Frequency Calls
8034A	SWD3-2	4	340	22	990	1356	2	0	0	0	0	0	14	16	1372
8034B	CUW/DIST	3	339	17	1657	2016	6	2	0	1	0	7	73	89	2105
8034C	CUW/DIST	33	376	45	2537	2991	3	0	0	0	0	0	30	33	3024
<b>Total</b>		40	1055	84	5184	6363	11	2	0	1	0	7	117	140	6503

SURVEY ROUND	STATION ID	SPECIES CODE																			WATER							
		NOAM	EANE	MUDP	BSSA	FTSA	FOTO	SSAL	AMDS	CHFR	PIFR	TLSA	AMTO	SPPE	NLFR	SMSA	RBSA	JESA	CHFR	DUSA	WOFR	GRTR	BULL	GRFR	MIFR	Present (Y/N)	Depth (CM)	
1	AMC1												2(10)														Y	14
2	AMC1	X																									Y	8
3	AMC1	X																									N	
1	AMC2	X																									Y	6
2	AMC2												1(2)														Y	6
3	AMC2	X																									N	
1	AMC3												3(30)														Y	8
2	AMC3	X																									Y	5
3	AMC3	X																									N	

SPECIES CODES	COMMON NAME	SCIENTIFIC NAME
EANE	Red-spotted Newt	<i>Notophthalmus viridescens</i>
MUDP	Mudpuppy	<i>Necturus maculosus</i>
BSSA	Blue-spotted Salamander	<i>Ambystoma laterale</i>
FTSA	Four-toed Salamander	<i>Hemidactylum scutum</i>
FOTO	Fowler's Toad	<i>Anaxyrus fowleri</i>
SSAL	Spotted Salamander	<i>Ambystoma maculatum</i>
AMDS	Allegheny Mountain Dusky Salamander	<i>Desmognathus ochrophaeus</i>
CHFR	Western Chorus Frog (Great Lakes / St. Lawrence - Canadian Shield population)	<i>Pseudacris triseriata</i>
PIFR	Pickereel Frog	<i>Lithobates palustris</i>
TLSA	Northern Two-lined Salamander	<i>Eurycea bislineata</i>
AMTO	American Toad	<i>Anaxyrus americanus</i>
SPPE	Spring Peeper	<i>Pseudacris crucifer</i>
NLFR	Northern Leopard Frog	<i>Lithobates pipiens</i>
SMSA	Small-mouthed Salamander	<i>Ambystoma texanum</i>
RBSA	Eastern Red-backed Salamander	<i>Plethodon cinereus</i>
JESA	Jefferson Salamander	<i>Ambystoma jeffersonianum</i>
CHFR	Western Chorus Frog (Carolinian population)	<i>Pseudacris triseriata</i>
DUSA	Northern Dusky Salamander	<i>Desmognathus fuscus</i>
WOFR	Wood Frog	<i>Lithobates sylvatica</i>
GRTR	Gray Treefrog	<i>Hyla versicolor</i>
BULL	American Bullfrog	<i>Lithobates catesbeiana</i>
GRFR	Northern Green Frog	<i>Lithobates clamitans</i>
MIFR	Mink Frog	<i>Lithobates septentrionalis</i>

CALL CODES	
X	No amphibians heard
1	Calls can be counted without error
2	Calls overlap but can be reliably estimated
3	Calls overlap too much to estimate number

Note: For each species, the first number is the call code and the second number, which is in brackets, is the number of individuals of that species heard calling.

**Table 11: Snake Transect and Area Search Survey Results**

DATE SURVEYED	SURVEY ROUND	TRANSECT OR STATION NUMBER	SPECIES CODE															
			NOSN	EAGA	MISN	BRSN	RBSN	NWSN	RISN	BLRA	BUGA	FOSN	HOSN	MASS	RNSN	SGSN	QUSN	
01-MA-18	1	T1	X															
01-MA-18	1	T2	X															
01-MA-18	1	T3	X															
01-MA-18	1	AS1	X															
01-MA-18	1	AS2	X															
14-MA-18	2	T1	X															
14-MA-18	2	T2	X															
14-MA-18	2	T3	X															

**LEGEND:**

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOSN	No Snakes	No snakes despite survey effort
EAGA	Eastern Gartersnake	<i>Thamnophis sirtalis sirtalis</i>
MISN	Eastern Milksnake	<i>Lampropeltis triangulum</i>
BRSN	DeKay's Brownsnake	<i>Storeria dekayi</i>
RBSN	Northern Red-bellied Snake	<i>Storeria occipitomaculata occipitomaculata</i>
NWSN	Northern Watersnake	<i>Nerodia sipedon sipedon</i>
RASN	Gray Ratsnake	<i>Pantherophis spiloides</i>
RISN	Eastern Ribbonsnake	<i>Thamnophis sauritus</i>
BLRA	Blue Racer	<i>Coluber constrictor foxii</i>
BUGA	Butler's Gartersnake	<i>Thamnophis butleri</i>
FOSN	Eastern Foxsnake	<i>Pantherophis gloyd</i>
HOSN	Eastern Hog-nosed Snake	<i>Heterodon platifihinos</i>
MASS	Massassauga	<i>Sistrurus catenatus catenatus</i>
RNSN	Ring-necked Snake	<i>Diadophis punctatus</i>
SGSN	Smooth Greensnake	<i>Opheodrys vernalis</i>
QUSN	Queensnake	<i>Regina septemvittata</i>

DATE	
MONTH	CODE
January	JA
February	FE
March	MR
April	AP
May	MA
June	JN
July	JL
August	AU
September	SE
October	OC
November	NO
December	DE

**Table 11: Snake Transect and Area Search Survey Results**

DATE SURVEYED	SURVEY ROUND	TRANSECT OR STATION NUMBER	SPECIES CODE															
			NOSN	EAGA	MISN	BRSN	RBSN	NWSN	RISN	BLRA	BUGA	FOSN	HOSN	MASS	RNSN	SGSN	QUSN	
14-MA-18	2	AS1	X															
14-MA-18	2	AS2	X															
17-MA-18	3	T1	X															
17-MA-18	3	T2	X															
17-MA-18	3	T3	X															
17-MA-18	3	AS1	X															
17-MA-18	3	AS2	X															

**LEGEND:**

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOSN	No Snakes	No snakes despite survey effort
EAGA	Eastern Gartersnake	<i>Thamnophis sirtalis sirtalis</i>
MISN	Eastern Milksnake	<i>Lampropeltis triangulum</i>
BRSN	DeKay's Brownsnake	<i>Storeria dekayi</i>
RBSN	Northern Red-bellied Snake	<i>Storeria occipitomaculata occipitomaculata</i>
NWSN	Northern Watersnake	<i>Nerodia sipedon sipedon</i>
RASN	Gray Ratsnake	<i>Pantherophis spiloides</i>
RISN	Eastern Ribbonsnake	<i>Thamnophis sauritus</i>
BLRA	Blue Racer	<i>Coluber constrictor foxii</i>
BUGA	Butler's Gartersnake	<i>Thamnophis butleri</i>
FOSN	Eastern Foxsnake	<i>Pantherophis gloyd</i>
HOSN	Eastern Hog-nosed Snake	<i>Heterodon platifihinos</i>
MASS	Massassauga	<i>Sistrurus catenatus catenatus</i>
RNSN	Ring-necked Snake	<i>Diadophis punctatus</i>
SGSN	Smooth Greensnake	<i>Opheodrys vernalis</i>
QUSN	Queensnake	<i>Regina septemvittata</i>

DATE	
MONTH	CODE
January	JA
February	FE
March	MR
April	AP
May	MA
June	JN
July	JL
August	AU
September	SE
October	OC
November	NO
December	DE

**Table 12: Significant Wildlife Habitat Assessment (Eco-Region 7E-3)**

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
<b>1. SEASONAL CONCENTRATION AREAS</b>					
Waterfowl Stopover and Staging Areas (terrestrial)	No – CUM present, but substantial flooding not present in spring	N/A	No	N/A	No
Waterfowl Stopover and Staging Areas (aquatic)	Yes – SWD is present	No – small SWD is isolated from other surface water features and considered unsuitable to support large numbers of waterfowl	No	N/A	No
Shorebird Migratory Stopover Areas	Yes – MAM present	No – no muddy and unvegetated shoreline habitats present adjacent to MAM	No	N/A	No
Raptor Wintering Areas	Yes – FOD and CUM present on Subject Lands	No – size criteria not met	No	N/A	No
Bat Hibernacula	No	N/A	No	N/A	No
Bat Maternity Colonies	Yes – FOD and SWD present on Subject Lands	No – forested communities did not contain snag trees at sufficient density	No	N/A	No
Turtle Wintering Areas	Yes – MA and SW ELC communities present	No – no water bodies sufficient to provide overwintering habitat are present	No	N/A	No
Reptile Hibernaculum	Yes	No – no suitable hibernaculum features present	No	N/A	No
Colonial Bird Nesting Sites (bank/cliff)	No	N/A	No	N/A	No
Colonial Bird Nesting Sites (tree/shrubs)	Yes – SWD present	No – SWD community is too small (0.13 ha) to provide significant habitat	No	N/A	No
Colonial Bird Nesting Sites (ground)	No – CUM and MAM2 are present, but watercourses are absent	N/A	No	N/A	No
Migratory Butterfly Stopover Areas	Yes – CUM and FOD are present	No – minimum size criteria not met	No	N/A	No

**Table 12: Significant Wildlife Habitat Assessment (Eco-Region 7E-3)**

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Migratory Landbird Stopover Areas	Yes - FOD and SWD present	No - Minimum size criteria for woodlands not met	No	N/A	No
Deer Winter Congregation Areas	Yes - FOD present	No - Minimum size criteria for woodlands not met	No	N/A	No
<b>2. RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE</b>					
<b>2a. Rare Vegetation Communities</b>					
Rare Vegetation Types (cliffs, talus slopes, sand barrens, alvars, old-growth forests, savannahs, and tallgrass prairies)	No - no rare vegetation types present	N/A	No	N/A	No
Other Rare Vegetation Types (S1 to S3 communities)	No - no other rare vegetation types present	N/A	No	N/A	No
<b>2b. Specialized Wildlife Habitat</b>					
Waterfowl Nesting Area	Yes - MAM2, SWD and upland habitats present	No - wetland area does not meet criteria (i.e., cluster of 3 or more wetlands <0.5 ha)	No	N/A	No
Bald Eagle and Osprey Habitats	Yes - FOD and SWD present adjacent to wetland (MAM2)	No - habitat is not suitable to provide nesting and foraging habitat for these species	No	N/A	No
Woodland Raptor Nesting Habitat	Yes - FOD and SWD present	No - forested area does not meet minimum size criteria	No	N/A	No
Turtle Nesting Areas	No	N/A	No	N/A	No
Seeps and Springs	No	N/A	No	N/A	No
Woodland Amphibian Breeding Habitats (within or < 120m from woodland)	Yes - FOD and SWD present on Subject Lands	Yes - wetland and vernal pool located within 120 m of a woodland	Yes	No - Indicator amphibian species not present (only American Toad was found to be breeding on the Subject Lands)	No
Wetland Amphibian Breeding Habitats (wetland >120m from woodland)	No - No MA on Subject Lands located >120 m from woodland	N/A	No	N/A	No

**Table 12: Significant Wildlife Habitat Assessment (Eco-Region 7E-3)**

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Woodland Area-Sensitive Bird Breeding Habitat	Yes - FOD and SWD present	No - no interior forest habitat present and minimum size criteria not met	No	N/A	No
<b>3. SPECIES OF CONSERVATION CONCERN</b>					
Marsh Bird Breeding Habitat	Yes - MAM2 and SW present	Yes	Yes	No - Indicator species not present	No
Open Country Bird Breeding Habitat	Yes - CUM1 present	No - minimum size criteria not met	No	N/A	No
Shrub/Early Successional Bird Breeding Habitat	Yes - CUW present	No - minimum size criteria not met	No	N/A	No
Terrestrial Crayfish	Yes - MAM2 and SWD present	Yes	Yes	No - No evidence of Terrestrial crayfish observed during field investigations	No
<b>Special Concern and Rare Wildlife Species</b>					
i. Black Gum (S3)	Yes - SWD is present	Yes	Yes	No - species not observed during botanical inventory	No
ii. Southern Ladies' Tresses (S1)	Yes - moist areas are present	Yes	Yes	No - species not observed during botanical inventory	No
iii. White-tinged Sedge (S3)	Yes - wet woodlands are present	Yes	Yes	No - species not observed during botanical inventory	No
iv. Reflexed Sedge (S2)	Yes - woodlands are present	Yes	Yes	No - species not observed during botanical inventory	No
v. Slightly Hirsute Sedge (S3)	Yes - woodlands are present	Yes	Yes	No - species not observed during botanical inventory	No
vi. Biennial Gaura (S3)	Yes - meadows and abandoned fields are present	Yes	Yes	No - species not observed during botanical inventory	No

**Table 12: Significant Wildlife Habitat Assessment (Eco-Region 7E-3)**

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
vii. Eggert's Thorn (S2)	Yes - woodlands are present	Yes	Yes	No - species not observed during botanical inventory	No
viii. Sundial Lupine (S2S3)	Yes - meadows and abandoned fields are present	Yes	Yes	No - species not observed during botanical inventory	No
ix. Broad Beech Fern (Special Concern)	No - suitable wet forest conditions not present	No	No	N/A	No
x. Common Hop Tree (Threatened, S3)	No - sandy soil areas not present	No	No	N/A	No
xi. Green Dragon (Special Concern)	Yes - damp deciduous forest is present in the SWD area on the Subject Lands	Yes	Yes	No - species not observed during botanical inventory	No
xii. Shumard Oak (Special Concern)	Yes - Deciduous forests with clay soils are present	Yes	Yes	No - species not observed during botanical inventory	No
xiii. Swamp Rose-mallow (Special Concern)	Yes - drainage ditch areas are present	Yes	Yes	No - species not observed during botanical inventory	No
xiv. Western Chorus Frog (S3)	Yes - potential breeding areas are present	Yes	Yes	No - species not observed during amphibian breeding studies	No
xv. Eastern Ribbonsnake (Special Concern)	No - Suitable habitat for this species not present	No	No	N/A	No
xvi. Snapping Turtle (Special Concern)	No overwintering habitat or suitable nesting habitat present	No	No	N/A	No
xvii. Northern Map Turtle (Special Concern)	No overwintering habitat or suitable nesting habitat present	No	No	N/A	No



**Table 12: Significant Wildlife Habitat Assessment (Eco-Region 7E-3)**

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
xviii. Eastern Wood-pewee (Special Concern)	Yes - Deciduous forest with limited understory is present	Yes	Yes	No - This species was not observed on the Subject Lands (it was observed in a woodland offsite, on the other side of John Street)	No
xix. Bald Eagle (Special Concern)	No- small woodland size and habitat not close to large waterbodies	No	No	N/A	No
xx. Canada Warbler (Special Concern)	No - suitable wet forest with dense shrub layer not present	No	No	N/A	No
xxi. Common Nighthawk (Special Concern)	Recently forested areas (circa May 2016) are present, but meadow regeneration has limited suitability for these species	No	No	N/A	No
xxii. Peregrine Falcon (Special Concern)	No - suitable habitat not present for this species	No	No	N/A	No
xxiii. Red-Headed Woodpecker (Special Concern)	Yes - suitable habitat for this species is present on the Subject Lands	Yes	Yes	No - species was not observed during breeding bird studies	No
xxiv. Wood Thrush (Special Concern)	No - Forested areas on Subject Lands do not contain well developed understory layers	No	No	N/A	No
xxv. Monarch (Special Concern)	Yes - Meadows with Milkweed are present on the Subject Lands	Yes	Yes	Yes - Monarch adults are present on the Subject Lands. However, area of habitat is relatively low and only occurred as a result of tree removals in 2016. Therefore, this habitat is not considered to be Significant.	No
xxvi. West Virginia White (Special Concern)	No - Two-leaved Toothwort not present	No	No	N/A	No
<b>4. ANIMAL MOVEMENT CORRIDORS</b>					
Amphibian Movement Corridors	No - Significant Amphibian Breeding Habitat is not present	N/A	No	N/A	No

**Table 13: Predicted Effects, Mitigation, Enhancement and Net Effects**

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
<b>Significant Natural Heritage Features</b>						
1. Significant Wetlands	<ul style="list-style-type: none"> <li>Not Present</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
2. Significant Coastal Wetlands	<ul style="list-style-type: none"> <li>Not Present</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
3. Significant Woodlands	<ul style="list-style-type: none"> <li>One significant woodland is present within the Subject Lands. Woodland includes cultural woodland and deciduous swamp communities</li> <li>Woodland boundary on the Subject Lands was staked with the Region of Niagara in July 2018</li> <li>Woodland meets the Region of Niagara criteria for significance based on the presence a wetland in the Greenbelt portion of the woodland</li> <li>Woodland is partially located with the Greenbelt and this portion is considered to be a Key Natural Heritage Feature in the Greenbelt Natural Heritage System</li> <li>Portion of woodland within Greenbelt meets criteria for designation as an Environmental Protection Area in the Region of Niagara Official Plan. Portion of woodland outside Greenbelt meets criteria for designation as an Environmental Conservation area in Region of Niagara Official Plan</li> <li>Selective harvesting was completed within the woodland in 2016 under a permit from the NPCA. Management has resulted in</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation removal (0.10 ha) outside the 30 m setback from the portion of the woodland within the Greenbelt</li> <li>Development and site alteration, including grading and heavy equipment use adjacent to the residual portions of the woodland</li> <li>Long-term presence of a residential community adjacent to the residual woodland</li> </ul>	<ul style="list-style-type: none"> <li>Permanent removal of 0.10 ha of significant woodland meeting Environmental Conservation Area criteria, resulting in an overall reduction in the size of the woodland</li> <li>Creation of a new edge within the residual portion of the woodland could result in edge effects (e.g., tree blow down, invasive species, weather effects). However, the existing woodland where the new edge will be created is only approximately 25 m wide and consists of two existing large trees. Given that this section of the woodland primarily functions as a widened hedgerow and these trees are exposed to the edge effects under current conditions, no new edge effects are anticipated as a result of creation of a new edge within the residual woodland</li> </ul>	<ul style="list-style-type: none"> <li>A 30 m Vegetation Protection Zone will be implemented from the staked woodland boundary for the residual portion within the Greenbelt to protect from indirect effects due to adjacent development and site alteration</li> <li>Enhancement within the residual woodland (e.g., replacement of dead/dying ash species and understory vegetation enhancement) and within the Vegetation Protection Zone will result in an overall enhancement to the ecological functions provided by the woodland</li> </ul>	<ul style="list-style-type: none"> <li>Removal of a portion of significant woodland, but enhancement to the overall ecological benefits provided by the residual woodland, which will continue to provide a range of ecological functions (e.g., generalized wildlife habitat, ecological corridor habitat). Overall, no net negative effects on the significant woodland and the Region's Core Natural Heritage System are predicted to occur</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of the success of woodland restoration measures and vegetation protection zone plantings. Monitoring to be confirmed following completion of detailed woodland restoration/vegetation protection zone design at the Site Plan Application stage</li> </ul>

**Table 13: Predicted Effects, Mitigation, Enhancement and Net Effects**

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
	<p>significant disruption to the understory, although over time, regeneration is anticipated to occur</p> <ul style="list-style-type: none"> <li>Ash is present within the woodland and is showing signs of mortality</li> </ul>					
<b>4. Significant Valleylands</b>	<ul style="list-style-type: none"> <li>Not Present</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>5. Significant Wildlife Habitat</b>	<ul style="list-style-type: none"> <li>Not Present</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<b>6. Fish Habitat</b>	<ul style="list-style-type: none"> <li>The upper reach of One Mile Creek crosses the existing driveway into the Subject Lands from John Street. This watercourse provides indirect fish habitat (Type 3 - Marginal). Baitfish have been captured in One Mile Creek approximately 1 km downstream from the Subject Lands. The reach of One Mile Creek on the Subject Lands is altered by an open bottom crossing on the existing driveway, while upstream and downstream reaches are highly altered by adjacent residential developments, including an online, concrete-lined pond downstream</li> <li>Indirect fish habitat (Type 3 - Marginal) is also present within the lower reach of the Tributary of One Mile Creek running through the Subject Lands</li> <li>This reach was assessed as a Headwater Drainage Feature and received a management recommendation of Conservation on the basis that this is likely to be a feature regulated by NPCA</li> </ul>	<ul style="list-style-type: none"> <li>Upgrades to the existing water crossing structure on the main branch of One Mile Creek on the existing driveway from John Street</li> <li>Earthworks (e.g., grading, filling) and vegetation removal on the Subject Lands during construction of the development could potentially result in decreased quality of surface water runoff (due to increased suspended solids) from the Subject Lands to One Mile Creek and its Tributary</li> <li>During construction, spills can occur from equipment and vehicles that could enter the surface water drainage feature and eventually direct fish habitat within One Mile Creek</li> <li>Stormwater run-off from the proposed development into the Tributary of One Mile Creek</li> </ul>	<ul style="list-style-type: none"> <li>Alterations in indirect fish habitat in One Mile Creek due to replacement of the existing water crossing with a longer structure. Effects anticipated to include increased enclosure of the watercourse and reduced riparian vegetation due to a longer structure</li> <li>Indirect effects on fish habitat in downstream portions of One Mile Creek could occur due to erosion and sedimentation from the disturbed work area during construction. Increased erosion from the Subject Lands could result in negative effects on fish habitat and mortality, health effects or altered behaviour of aquatic biota (benthic invertebrates and fish)</li> <li>During construction, water quality, aquatic biota (fish and benthic invertebrates) and vegetation could be negatively affected due to spills</li> <li>Stormwater runoff from the proposed development, if not properly treated, could potentially result in negative effects to water quality in One Mile Creek</li> <li>Changes in water balance could alter surface water flows in the tributary and One Mile Creek itself, which could have negative effects on downstream direct fish habitat (e.g.,</li> </ul>	<ul style="list-style-type: none"> <li>The proposed watercourse crossing will be designed to meet appropriate flow conveyance requirements to ensure contributing habitat functions are maintained (e.g. flow and sediment conveyance) to support downstream fish habitat (off the Subject Lands). Erosion protection materials may be required on the banks upstream and downstream from the structure, although this will be determined during detailed design. Riparian vegetation restoration will occur in all disturbed areas adjacent to the new structure. Installation will follow in-water work timing windows specified by MNRF and work site isolation and other erosion and sedimentation control measures will be used as necessary during installation of the crossing to prevent downstream indirect effects</li> <li>An Erosion and Sedimentation Control Plan will be developed and implemented prior to construction</li> <li>During construction, the contractor will have spill kits on</li> </ul>	<ul style="list-style-type: none"> <li>No net effect on direct fish habitat in downstream reaches of One Mile Creek is anticipated to occur as a result of development on the Subject Lands during or following construction</li> <li>Indirect fish habitat functions provided by the watercourse on the Subject Lands will be maintained and protected through the use of buffers, SWM mitigation measures, construction best management practices for working in and around water</li> </ul>	<ul style="list-style-type: none"> <li>Construction monitoring to ensure effectiveness and maintenance of the ESC and spill prevent and response measures throughout construction</li> <li>Stormwater runoff quality monitoring is anticipated to be required as a condition of provincial approvals for the stormwater management system</li> </ul>

**Table 13: Predicted Effects, Mitigation, Enhancement and Net Effects**

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
	<ul style="list-style-type: none"> <li>This reach of the feature is highly degraded due to adjacent residential development off the Subject Lands. The banks of the feature are highly altered and consist of a variety of different types of retaining walls, some in various states of disrepair. Rear yards back onto the top of the channel bank, with limited riparian vegetation. The property fence line, in many areas runs within the mid-point of the channel</li> <li>The feature does not provide any direct fish habitat, but may provide contributing habitat functions to downstream reaches of One Mile Creek that do provide direct fish habitat (i.e., downstream from King Street, approximately 1 km downstream from the Subject Lands)</li> <li>Upstream reaches of the tributary are primarily excavated ditches associated with the adjacent pedestrian trail and provide limited ecological function to downstream fish habitat</li> </ul>	<ul style="list-style-type: none"> <li>Changes in water balance in the Tributary of One Mile Creek due to stormwater management and conveyance of flow to downstream fish habitat</li> <li>Installation of buried services (i.e., sanitary sewer and water distribution piping) beneath the upstream reaches of the Tributary on the Subject Lands</li> <li>Installation of underground tank discharge piping within setback and installation of outlet to Tributary of One Mile Creek</li> </ul>	<p>reduced habitat if flow reductions occur, or increased erosion if flow increases occur)</p> <ul style="list-style-type: none"> <li>Installation of buried piping could result in short-term effects on flows and water quality in the Tributary, with potential negative effects on downstream fish and fish habitat (off the Subject Lands)</li> <li>Installation of buried piping within the 10-m buffer could result in temporary and long-term impacts on riparian function. Installation of discharge to the Tributary of One Mile Creek could result in negative effects on indirect habitat</li> </ul>	<p>site, manage spills accordingly, and report MOECC Spills Action Centre, if applicable</p> <ul style="list-style-type: none"> <li>All existing reaches of the Tributary of One Mile Creek on and upstream from the Subject Lands will be maintained as open channel features to continue to convey flow and provide indirect fish habitat contributions supporting downstream direct fish habitat (off the Subject Lands)</li> <li>Stormwater from the proposed development will be appropriately treated prior to discharge to prevent negative impacts on water quality in downstream fish habitat</li> <li>A 10-m buffer will be used adjacent to the residual open portion of the Tributary of One Mile Creek on the Subject Lands to maintain riparian function and enhanced buffer vegetation plantings will be implemented to improve riparian functions. No transition grading will occur within the buffer.</li> <li>A 5-m naturalized corridor is recommended on either side of the existing ditch that will be maintained with the park upstream from the access route from Charlotte Street.</li> <li>Surface water and groundwater mitigation (e.g., Low Impact Development) measures are proposed to maintain water balance to the Tributary of One Mile Creek on the Subject Lands</li> <li>Minor system flows from much of the Subject lands will be</li> </ul>		

**Table 13: Predicted Effects, Mitigation, Enhancement and Net Effects**

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
				<p>conveyed to the SWM storage tank, which will provide quality, quantity and erosion control in accordance with local and provincial criteria</p> <ul style="list-style-type: none"> <li>• Installation of buried services crossing the tributary will adhere to in-water works timing recommendations and erosion and sedimentation control measures and water management measures (if necessary) will be implemented during installation. Post-construction restoration of bed, banks and riparian area (to match or exceed existing conditions) will be completed</li> <li>• The discharge pipe from the underground storage tanks will be located as far as possible from the watercourse channel. The discharge structure will be designed to mitigate effects on indirect habitat at the discharge point (i.e., erosion will be prevented at the outlet). Post-installation site restoration will be completed</li> </ul>		
7. Habitat of Endangered and Threatened Species	• Not Present	• N/A	• N/A	• N/A	• N/A	• N/A
8. Provincially Significant Areas of Natural and Scientific Interest	• Not Present	• N/A	• N/A	• N/A	• N/A	• N/A

**Table 13: Predicted Effects, Mitigation, Enhancement and Net Effects**

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
<b>Other Features</b>						
<p><b>1. Unevaluated Wetlands</b></p>	<ul style="list-style-type: none"> <li>One unevaluated deciduous swamp wetland (0.23 ha) is present within the woodland on the Subject Lands.</li> <li>Wetland is hydrologically isolated and is therefore should not be regulated by NPCA under O.Reg. 155/06.</li> <li>The 0.23 ha wetland does not meet the typical 2 ha threshold to be evaluated under the Ontario Wetland Evaluation System (OWES; MNRF 2013). Further, the closest evaluated wetland is more than 750 m away and is located in a different watershed, and therefore, this small wetland unit could not be complexed into a larger wetland. Although OWES (MNRF 2013) notes that wetlands smaller than 2 ha can still be considered for evaluation (particularly if they are part of a complex), this wetland does not provide any significant functions that would warrant evaluation on its own</li> <li>The wetland does not contain habitat for Endangered, Threatened or locally rare species and has limited biodiversity</li> <li>The wetland does not support hydrology of any watercourses (either through direct surface water connection or groundwater contributions)</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation clearing, grading and development</li> </ul>	<ul style="list-style-type: none"> <li>An 0.10-ha portion of the wetland is proposed for removal to facilitate the proposed development. This will result in generalized impacts on wildlife habitat (non-SWH) and local habitat diversity, although the wetland does not support any significant species</li> <li>The wetland does not play a significant role in hydrological regulation, although it does retain some water and promote infiltration/evaporation. Loss of this wetland drainage area will be accounted for in the overall water balance to ensure site-wide water balance is maintained to a sufficient level to maintain regional groundwater resources</li> </ul>	<ul style="list-style-type: none"> <li>No avoidance, mitigation and/or restoration is proposed to address the loss of wetland area, given that the wetland provides limited (and non-significant) ecological and biophysical functions</li> <li>A 30 m VPZ from the portion of the wetland in the Greenbelt, coupled with vegetation restoration within the VPZ is anticipated to provide benefits to the residual portion of the wetland (0.13 ha). The wetland will continue to receive hydrological inputs from direct precipitation and snowmelt, as well as runoff from adjacent areas in similarity to the existing hydrological regime of the feature</li> </ul>	<ul style="list-style-type: none"> <li>Reduction of wetland area (0.10 ha), but no negative effects on residual portions of the Natural Heritage System</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

**Table 13: Predicted Effects, Mitigation, Enhancement and Net Effects**

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
	<ul style="list-style-type: none"> <li>The wetland provides generalized wildlife habitat but does not meet the criteria to provide any Significant Wildlife Habitat</li> <li>The wetland provides limited social value</li> </ul>					
<p><b>2. Headwater Drainage Features</b></p>	<ul style="list-style-type: none"> <li>Four headwater drainage features are present on the Subject Lands, with a total of 8 distinct reaches identified and evaluated.</li> <li>These features ultimately drain to One Mile Creek off the Subject Lands</li> <li>One reach (H1-S4) was recommended for Conservation, since it contributes indirectly to downstream fish habitat and is likely considered to be a watercourse that would be regulated by NPCA under O.Reg. 155/05</li> <li>Three reaches (H1A-S1, H1-S1 and H1-S3) were recommended for Mitigation, since they provide early spring hydrological contributions to One Mile Creek. They are ephemeral and typically only flow in response to snowmelt and precipitation events</li> <li>Two reaches (H1B-S1 and H1C-S1) appeared as swales on a residential lawn area, but they were not found to be flowing during any of the HDF assessment periods. Given that they do not appear to provide any biophysical or ecological functions, they were recommended as not requiring any long-term management</li> </ul>	<ul style="list-style-type: none"> <li>Site alteration (e.g., vegetation removal, grading) and development on the Subject Lands</li> <li>Stormwater management on the Subject Lands</li> </ul>	<ul style="list-style-type: none"> <li>No direct effects on the reach recommended for Conservation (H1-S4). This reach will be left in place. Adjacent development could potentially result in impacts on riparian habitat and function, water quality and indirect aquatic habitat. Stormwater management on the Subject Lands could result in negative effects on hydrology and/or erosion</li> <li>Reach H1-S3 (recommended for Mitigation) will be maintained within an open channel feature to continue to convey off-site flows to the Tributary</li> <li>Reaches H1-S1 and H1A-S1 (recommended for Mitigation) will be left in place with no direct alteration, since they are located off the Subject Lands. Drainage from the reaches will be maintained through reaches H1-S3 and H1-S4 on the Subject Lands and ultimately to One Mile Creek. This will maintain the hydrological functions provided by these reaches</li> <li>Reaches H1B-S1 and H1C-S1 will be removed with grading on the Subject Lands. No negative impacts on downstream ecological or biophysical functions are predicted due to this removal</li> </ul>	<ul style="list-style-type: none"> <li>Reach H1-S4 (Conservation) will be protected with a 10-m vegetated setback (see Fish Habitat row for details)</li> <li>Reach H1-S3 (Mitigation) will be protected with a 5-m naturalized corridor within the parkland</li> <li>Maintenance of all existing reaches on the Subject Lands that require Mitigation will ensure that downstream hydrological contributions to One Mile Creek and its Tributary off the Subject Lands are maintained</li> <li>Removal of headwater drainage features will occur under dry conditions and erosion and sedimentation controls will be implemented to prevent negative impacts on downstream watercourses</li> </ul>	<ul style="list-style-type: none"> <li>Several headwater drainage features will be removed, although no net effect on the overall ecological or biophysical function of the headwater drainage feature network is anticipated to occur following implementation of mitigation</li> </ul>	<ul style="list-style-type: none"> <li>Erosion and sedimentation control measure monitoring during construction to confirm that mitigation is implemented as designed and functioning as intended</li> </ul>

**Table 13: Predicted Effects, Mitigation, Enhancement and Net Effects**

NATURAL HERITAGE FEATURES AND ASSOCIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE, MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
<p><b>3. Ecological Linkages/Corridors</b></p>	<ul style="list-style-type: none"> <li>The southwestern portion of the Subject Lands (i.e., within the Greenbelt) has been identified by the Province as part of the Greenbelt Natural Heritage System, likely on the basis that it provides a linkage from the Paradise Grove Plain ANSI (east of the Subject Lands) to a woodland identified by MNRF as providing deer overwintering habitat to the south of the Subject Lands</li> <li>The linkage corridor consists of a variety of land use and cover types including woodland and disturbed open habitats (on the Subject Lands) and residential and agricultural (grape vineyards) off the Subject Lands. John Street bisects the linkage</li> </ul>	<ul style="list-style-type: none"> <li>Development and site alteration on the Subject Lands</li> <li>Removal of a portion of the Significant Woodland on the Subject Lands, although this portion of the woodland appears to provide limited linkage functions and is located outside the designated Greenbelt Natural Heritage System, which likely provide the bulk of wildlife movement function in the overall area</li> </ul>	<ul style="list-style-type: none"> <li>No development will occur within the Greenbelt boundary although minor site alteration due to up to 2 m of transition grading from adjacent lots will occur</li> <li>Short term effects on wildlife movements in the linkage area may occur due to increased noise and human presence during construction of the proposed development, although the existing linkage corridor is highly disturbed and local wildlife are likely tolerant of some degree of disturbance. However, wildlife may avoid the linkage or use other areas for movement during periods of heavy construction on the Subject Lands</li> </ul>	<ul style="list-style-type: none"> <li>All portions of transition grading within the Greenbelt Plan will be revegetated</li> <li>Opportunities to enhance the function of the linkage on the Subject Lands will be examined during detailed design. This could include enhancements to vegetation structure and coverage within the existing woodland and enhancements to vegetation within the proposed vegetation protection zone around the woodland</li> </ul>	<ul style="list-style-type: none"> <li>Short term effects on wildlife use of the linkage may occur during construction of the proposed development</li> <li>No long-term negative effects on wildlife movements in the linkage are anticipated following implementation of enhancement measures</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of the success of woodland restoration measures and vegetation protection zone plantings. Monitoring to be confirmed following completion of detailed woodland restoration/vegetation protection zone design at the Site Plan Application stage</li> </ul>



**Appendix C – EIS Terms of Reference and Third Party Review Comments**



May 10<sup>th</sup>, 2018

Mr. Pat Busnello, Manager Development Planning  
Planning and Development Services  
1815 Sir Isaac Brock Way,  
Thorold, ON

Re: North-South Environmental Peer Review - 200 John St & 588 Charlotte St Subdivision, Niagara-on-the-Lake, ON TOR

Dear Mr. Busnello,

North-South Environmental (NSE) has been retained by Niagara Region to review the Solmar Terms of Reference (TOR) for 200 John St and 588 Charlotte St Subdivision, in the Town of Niagara-on-the-Lake (herein referred to as the 'Subject lands') from a Natural Heritage perspective. As acknowledged in the proposed TOR, the subject lands and adjacent properties include areas identified as Environmental Protection Area (EPA) and Environmental Conservation Area (ECA) in the Regional Municipality of Niagara Official Plan Core Natural Heritage Map (Niagara Region 2015). Following our review of the proposed TOR, we would like to provide the following comments and recommendations:

- The subject lands fall within a Highly Vulnerable Aquifer (HVA) as identified using the Niagara Peninsula Conservation Authority Watershed Explorer tool (<http://maps.npca.ca>), suggesting that the area is also sensitive to contamination. This information should be carefully considered during the EIS for the development of the subdivision, with particular regard for the Provincial Policy Statement Section 2.2.1d) regarding the protection of municipal drinking water supplies and *designated vulnerable areas* of which HVAs qualify. It is noted that the proposed TOR will complete a Headwater Drainage Feature Assessment (HDFA) to characterize and confirm ecological functions of surface water drainage features. It does not however make specific reference to the review/consideration of groundwater vulnerable areas identified for the Niagara Peninsula Source Protection Area. Therefore, it is recommended that such policies for HVA areas that set out the need to consider the vulnerability when moving forward with any activity including careful enforcement of well drilling and decommissioning standards be considered. If groundwater monitoring wells are required, their location and construction should consider the protection of drinking water. It is recommended that the Assessment Report and Source Protection Plan be specifically considered in the TOR/EIS.
- As part of the background review, we recommend that all (if any exist) relevant field-based information collected through studies (within 5 years) for the subject lands and on adjacent lands also be reviewed and integrated in the EIS where relevant;
- There is no reference to drip line considerations in the proposed TOR. As per the EIS Guidelines (Regional Municipality of Niagara, 2018), for woodland boundaries, the drip line of the

outermost trees which form the woodland edge must be staked. Further to this, ELC communities following surveys and boundary staking of the site and on immediate adjacent lands should be overlaid on the most recent orthoimagery of sufficient resolution to clearly show features at the scale required (i.e., approximately 0.5 ha);

- It is not clear what consideration, if any, that corridors and linkages will be evaluated. A description of corridors and linkages between and among natural features and areas, surface water features and ground water features both on the site and in the surrounding areas should be provided (Regional Municipality of Niagara, 2018).
- As part of the 'Description of Proposed Development', it is recommended that the building envelope be provided as an overlay to all natural heritage features on site with the most recent available orthoimagery as the base layer. The presence of potential future hazard trees should be taken into consideration when delineating the infrastructure envelope and determining impacts to the woodland/aquatic features from the use proposed;
- Any woodland / aquatic features required to be protected should be clearly identified and adequate protection measures illustrated on a mapped figure.
- As indicated in the proposed TOR, individuals involved in each of the field inventories and EIS analysis will be included. We would also recommend that professional qualifications and all data sheets supporting the level of effort for all flora and fauna inventories, including dates and times for each field survey also be provided.
- Please note that Niagara Region has recently approved an updated EIS Guidelines Report (Ver. 2, March 2018) and that this version, as opposed to Version 1 referenced in the TOR, should be used to guide the EIS process and requirements for the subject lands.

Thank you for considering NSE's comments on this Terms of Reference. Please don't hesitate to contact us if you have any further questions.

Sincerest Regards,



Melissa Tonge, B.Sc., M.Sc.  
North-South Environmental Inc.

**References:**

Regional Municipality of Niagara. 2018. Environmental Impact Study Guidelines, Version 2, January, 2018.

## SCOPED ENVIRONMENTAL IMPACT STUDY: TERMS OF REFERENCE

Solmar Development Corp.  
200 John Street & 588 Charlotte Street Subdivision  
Niagara-on-the-Lake, ON

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### INTRODUCTION

This Terms of Reference (ToR) for a Scoped Environmental Impact Study (EIS) provides an overview of the work to be completed on behalf of Solmar Development Corp. (Solmar) for the proposed development of a subdivision at 200 John Street and 588 Charlotte Street, in the Town of Niagara-on-the-Lake (hereafter referred to as the Subject Lands). The Subject Lands are generally bound by John Street to the northeast, The Promenade to the southwest and Charlotte Street to the northwest (**Figure 1, Appendix A**). The two properties have previously been used for residential purposes, but both are currently vacant with residual residential buildings and associated open space, including areas identified as Environmental Protection Area and Environmental Conservation Area in the Regional Municipality of Niagara Official Plan Core Natural Heritage Map (Niagara Region 2015).

The Subject Lands are predominantly located within the Town of Niagara-on-the-Lake Urban Area boundary, although a portion is located outside the Urban Area. The Subject Lands are also located within the Greenbelt planning area; the portion within the Urban Area boundary is a Settlement Area under the Greenbelt Plan, while the remainder of the Subject Lands are located within the Protected Countryside, as shown on **Figure 2 (Appendix A)**, which is also designated part of the Niagara Peninsula Tender Fruit and Grape Area under the Greenbelt Plan. The proposed subdivision will be restricted to the portion of the Subject Lands located within the Urban Area. The portion of the Subject Lands within the Protected Countryside/Niagara Peninsula Tender Fruit and Grape Area is identified as part of the Greenbelt Natural Heritage System.

Solmar is proposing a mixed-use development on the Subject Lands and is proceeding with a Draft Plan of Subdivision to facilitate future development. Based on the presence of Environmental Protection Area, Environmental Conservation Area and the Greenbelt Natural Heritage System on and adjacent to the Subject Lands, an EIS will be required to support municipal planning approvals for the proposed Draft Plan of Subdivision.

The ToR establishes the process and content of the scoped EIS to be developed to guide preparation of the Draft Plan of Subdivision proposed for the Subject Lands. Scoping of the EIS is considered warranted based on the existing conditions of the Subject Lands. This ToR is based upon the existing natural feature types present on the Subject Lands and the adjacent lands, based on a site reconnaissance in spring 2017 and review of existing available information. The Scoped EIS will provide an analysis of potential impacts on natural heritage features and associated natural functions, based upon detailed site observations, as well as avoidance and mitigation measures proposed.

This ToR summarizes the ecological investigations that are proposed for completion in the 2018 field season. It also identifies the proposed outline and content of the scoped EIS report that will be prepared in response to the proposed development. The content of this ToR has been based

on Niagara Region’s Environmental Impact Study Guidelines (Niagara Region 2012), with consideration for the natural heritage evaluation requirements identified in the Greenbelt Plan (MMAH 2017).

## 1. NATURAL HERITAGE PLANNING CONSIDERATIONS

The Scoped EIS report will assess the quality and extent of natural heritage features found on and adjacent to the Subject Lands as related to the following policy and legislative framework, the relevancy of which will be described in the report:

- Provincial Policy Statement (PPS) (2014);
- Provincial *Endangered Species Act* (ESA) (2007);
- Niagara Region Official Plan (2015);
- Town of Niagara-on-the-Lake Official Plan (2017);
- Greenbelt Plan (2017);
- Niagara Peninsula Conservation Authority (NPCA; O.Reg. 155/06);
- Federal *Fisheries Act*; and
- Federal *Migratory Birds Convention Act*.

## 2. DESKTOP AND FIELD DATA COLLECTION

The Scoped EIS report will include a review of available background references, including the following:

- Ministry of Natural Resources and Forestry (MNRF) Land Information Ontario (LIO) database;
- Natural Heritage Information Centre (NHIC) database;
- Information on potential Species at Risk (SAR) provided by MNRF in response to an Information Request Form (IRF);
- Fisheries and Oceans Canada (DFO) Aquatic SAR Distribution Mapping;
- Wildlife atlases (i.e., Ontario Breeding Bird Atlas, Amphibian and Reptile Atlas, Butterfly Atlas);
- One Mile Creek Watershed Management Plan (NPCA 2005); and
- Historical reports and data for the Subject Lands by others (e.g., fish community sampling results).

The Scoped EIS will also include discussions related to agency correspondence (e.g., MNRF, NPCA, Town of Niagara-on-the-Lake, Regional Municipality of Niagara) and will outline the technical methods and field studies conducted to develop an understanding of the natural heritage features present on and adjacent to the Subject Lands.

The proposed technical methods for proposed ecological field studies are discussed briefly below. The technical methods used for each of the field studies implemented will be briefly outlined in the Scoped EIS.

### ***Site Reconnaissance Survey Methods***

Initial site reconnaissance was completed in May 2017 to develop a preliminary understanding of the types of natural features and associated wildlife habitat present on and adjacent to the Subject Lands. An additional 1-day site reconnaissance will be completed in March 2018 to further assess wildlife habitat types present on the Subject Lands, complete preliminary Ecological Land Classification (ELC) mapping, complete a leaf-off bat habitat assessment (described in more detail below) and confirm that the proposed 2018 field program adequately addresses the habitat types found on and adjacent to the Subject Lands.

### ***Ecological Land Classification & Botanical Survey Methods***

Vegetation community types will be confirmed, sampled and revised, if necessary, using the sampling protocol of the ELC for Southern Ontario (Lee et al. 1998). Preliminary ELC mapping will be completed during the site reconnaissance in March 2018 and this mapping will be refined during other botanical surveys. ELC will be completed to the finest level of resolution (Vegetation Type) where feasible. Botanical inventories will also be completed on the Subject Lands in early summer and late summer 2018 to document the vegetation species present. During the site reconnaissance in March 2018, an assessment of the requirements for a spring botanical inventory will be made.

### ***Breeding Bird Survey Methods***

Breeding Bird Surveys (area searches, point counts) will be conducted according to the Ontario Breeding Bird Atlas protocol (OBBA 2001-2005), which includes two surveys at least two weeks apart within the main breeding season from late May to early July. Point counts will occur within the period between dawn and 5 hours after dawn. All habitat types will be covered on foot. SAR birds with potential habitat on the Subject Lands and/or noted by the MNR as occurring in the area will be targeted during these surveys. Each point count station will be surveyed for 10 minutes for birds within 100 m and outside 100 m. All species recorded at point count stations will be mapped to provide specific spatial information and will be observed for signs of breeding behaviour. A third Breeding Bird Survey would be required if there was grassland or hay field habitat suitable for breeding by several specific species at risk birds (i.e., Bobolink and Eastern Meadowlark). The requirement for a third survey will be based on habitat suitability observations made during the second survey.

Structures on the Subject Lands will also be checked for Barn Swallow nests.

### ***Amphibian Survey Methods***

Three rounds of breeding calling amphibian surveys will be completed in April, May and June following standard protocols outlined in the Great Lakes Marsh Monitoring Program (BSC 2003). Stations will be identified using a preliminary review of aerial photography and observations made during the previous site reconnaissance. Surveys will be conducted on warm nights with little wind. Surveys commence one half hour before dusk and end before midnight. Visits must be 15 days apart and as per protocol, the first will occur with a minimum nighttime air temperature of 5°C, the second visit with a minimum of 10°C and the third visit with a minimum of 17°C. If noise from plane, road traffic and/or trains is present, monitoring will not begin until

there is a quiet period. The initial reconnaissance will determine whether suitable conditions exist for amphibians on the Subject Lands – based on this, there is potential that not all surveys will be required.

Each station will be surveyed for three minutes and a three-level call category system will be utilized to identify the activity of the frogs and toads. The call levels are: 1) individual calls do not overlap and calling individuals can be discreetly counted; 2) calls of individuals sometimes overlap but number of individuals can still be estimated; and, 3) overlap among calls seems continuous (full chorus) and a count estimate is impossible. Anurans are recorded as within the station if they were within 100 m. All other species are recorded as incidental records heard outside the station.

An amphibian egg mass survey will be conducted concurrently with the first round of amphibian call surveys to confirm if suitable habitat for salamanders is present, and if so, if they are breeding on the Subject Lands. This includes an active search in the vicinity of the potential breeding habitats for adult salamanders (i.e., lifting woody debris and returning it to original location to maintain microhabitat conditions). During the egg-mass survey, the entire perimeter of any potential breeding area will be walked, and a visual scan will be conducted of potential egg-mass attachment sites. The area will be scanned for a total of 30 minutes or until all egg attachment sites have been checked, whichever is less.

### ***Snake Survey Methods***

Three snake surveys will be conducted in the open spaces on the Subject Lands during the spring emergence period (April to mid-May) when the probability of detecting snakes is higher. A visual encounter survey approach was employed, which included active searching of natural materials and debris that could serve as refuge or covered basking sites. Surveys will be conducted on mild spring mornings (minimum 12°C) between 8:00 AM and 2:00 PM, with sunny or partly overcast conditions. Surveys will not be conducted on days with rain or high winds. Data recorded during snake surveys will include species observations and locations (UTM coordinates), air temperature, start and end time, and weather conditions. Survey methods are based on MNRF SAR protocols and Toronto Zoo snake survey protocols.

### ***Turtle Nesting Survey Methods***

Based on preliminary assessments of the habitat types present on the Subject Lands, there does not appear to be any suitable turtle overwintering areas present. However, there could be overwintering areas present on lands within proximity to the Subject Lands. Two turtle nesting surveys will be completed in spring 2018 to confirm if turtles from adjacent areas are nesting on the Subject Lands. Candidate nesting areas include: shores/beaches of wetlands and drainage features; trails and driveways; and farm field margins (etc.) so long as suitable substrate and sun exposure are present. These areas will be ground-truthed and, where potential habitat is noted, a soil auger sample will be completed to confirm soil substrate and depth. Data recorded include: nesting area size, % slope of the nesting area, % canopy cover over the nesting area, direction of orientation (i.e., east facing), location (UTM coordinates), soil substrate and depth, and distance from roadways.



### ***Bat Habitat Assessment Survey Methods***

A bat habitat assessment will be completed during leaf-off conditions in early spring 2018 to screen the wooded areas for suitable roosting habitat for SAR bats. The survey will target snag/cavity trees greater or equal to 10 cm diameter at breast height (DBH) that exhibit peeling bark or early stages of decay (Watt and Caceres 1999), and cavities or crevices originating from cracks, knots, holes or woodpecker activity. The information collected for each snag/cavity tree will include tree species, number of cavities, decay class, UTM coordinates, and representative photos. Surveys will be scoped to woodland features/treed areas and anthropogenic features (e.g., barns and houses) proposed for removal.

The proposed field program is adapted from the MNRF Guelph District's (April 2017) Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis Tri-colored Bat.

### ***Bat Acoustic Survey Methods***

Provided suitable trees are present on the Subject Lands, acoustic surveys will be conducted in June 2018 to determine presence/absence of four endangered bat SAR: Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Tri-coloured Bat (*Perimyotis subflavus*) and, Northern Long-eared Myotis (*Myotis septentrionalis*). Acoustic data will also assist in determining if Significant Wildlife Habitat for bat maternity colonies is present, if suitable habitat conditions exist.

To address both clutter specialists such as the Northern Long-eared Myotis and open-space flyers like the Little Brown Myotis and Eastern Small-footed Myotis, acoustic monitoring stations will be selected to target the tallest snags on the Subject Lands, clusters of suitable snags, and open foraging areas.

Passive acoustic bat surveys using Wildlife Acoustic SM3BAT or SM4BAT ultrasonic recorders will be conducted in the woodland area in the southwest portion of the Subject Lands. Detectors will be deployed for 10 days in June and set to record 30 minutes before dusk through the night to 30 mins after dawn.

### ***Incidental Mammal, Reptile and Invertebrate Observations***

Savanta will record all incidental observations of mammals, reptiles, amphibians and invertebrates (including *Odonata* and *Lepidoptera*) during each of the above noted surveys and provide the federal, provincial, regional and local rarity ranking, where present.

### ***Headwater Drainage Feature Assessment***

A Headwater Drainage Feature Assessment (HDFA) will be conducted in accordance with the Credit Valley Conservation (CVC)/Toronto and Region Conservation Authority (TRCA) Guidelines for the "Evaluation, Classification, and Management of Headwater Drainage Features" (2014) to characterize and confirm the ecological functions of the surface water drainage feature on the Subject Lands. The HDFA requires at least two site visits (which will be completed in April and May 2018), with a third visit necessary in summer (July or August) if the

drainage feature(s) contains standing or flowing water during the May assessment.

### ***Aquatic Habitat Assessment***

Aquatic habitat conditions in the One Mile Creek channel at, upstream and downstream from the existing culvert (within property owned by Solmar) on the access road into the property from John Street will be assessed during each round of HDFA field surveys. Instream and riparian habitat features, and existing culvert conditions will be mapped and assessed since upgrades to the culvert are anticipated to be required.

### **3. BIO-PHYSICAL CHARACTERIZATION**

The Scoped EIS will include a bio-physical characterization section that will outline the results of the desktop and field data collection efforts, including physical data collected by others (e.g., from geotechnical investigations). Results will be discussed by topic, including, but not limited to the following:

- Topography, physiography, soils and geology;
- Surface water and groundwater;
- Fish habitat;
- Vegetation (botanical species and ELC communities);
- Birds;
- Amphibians;
- Reptiles;
- Bats;
- Incidental Species; and
- Natural hazards.

### **4. ANALYSIS OF ECOLOGICAL AND NATURAL HERITAGE SIGNIFICANCE AND CONSTRAINTS TO DEVELOPMENT**

The natural heritage and hydrologic features and functions identified will be assessed for significance and sensitivity to identify features that will require protection, including appropriate buffers or vegetation protection zones (VPZ) through the Natural Heritage System incorporated into the proposed development on the Subject Lands.

The PPS (2014), issued under Section 3 of the *Planning Act*, provides direction on matters of provincial interest related to land use planning and development. The PPS states that it “...supports a comprehensive, integrated and long-term approach to planning...” The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

Savanta’s work will address those policies that are specific to Natural Heritage (section 2.1) with some reference to other policies with relevance to natural heritage and impact assessment considerations and areas of overlap.

The significant natural heritage features defined in the 2014 PPS, are:

- Significant Wetlands;
- Significant Coastal Wetlands;
- Other Coastal Wetlands;
- Fish Habitat;
- Significant Woodlands;
- Significant Valleylands;
- Habitat of Endangered and Threatened Species;
- Significant Wildlife Habitat; and
- Significant Areas of Natural and Scientific Interest (“ANSIs”).

The Natural Heritage Reference Manual (NHRM) (MNRF 2010) and guidance provided in local and regional Official Plans will be referred to for guidance regarding how these natural heritage features are to be addressed under the Provincial Policy Statement (PPS) (MMAH 2014).

Savanta’s work will also address the Greenbelt Plan natural heritage system policies for those portions of the Subject Lands located within the Greenbelt Plan area. Accordingly, key natural heritage features and key hydrological features, as defined in the Greenbelt Plan (MMAH 2017) will be identified. The Scoped EIS will also address areas identified as Environmental Protection Area and Environmental Conservation Area in the Regional Municipality of Niagara Official Plan.

Based on the desktop and field data collection results and associated analysis of the significance and sensitivity of natural features, the Scoped EIS will identify constraints to development on the Subject Lands (i.e., areas where development is not permitted or not recommended, or areas where development may be permitted subject to results of the impact assessment). The natural heritage feature limits and required buffers/vegetation protection zones will be depicted on mapping within the EIS (i.e., the Constraints Map) to outline the limit of the proposed development with respect to protection of natural heritage features on or adjacent to the Subject Lands (as may be required). The analysis of constraints will include an assessment of buffer/VPZ sizes.

## **5. DESCRIPTION OF PROPOSED DEVELOPMENT**

The proposed development is anticipated to consist of a mix of residential land uses (townhouses, semi-detached and single detached), roads, parks, open space and stormwater management facilities. Road access into the proposed subdivision is anticipated to be provided from John Street and Charlotte Street.

The Scoped EIS will describe the nature, scale and purpose of the proposed development and will outline the following (as may be relevant):

- Locations and boundaries of proposed lots;
- Any other buildings or structures (if planned);
- Amenity areas;
- Roads (public and private) and parking areas;
- Other transportation facilities;
- Site servicing;

- Storm water management; and,
- Any proposed water takings.

The description of the proposed development will also include information regarding construction to the extent it is available at the time of preparation. The Scoped EIS will include a detailed site plan overlaid on the constraints map.

The natural heritage work will rely in part, upon reports prepared by others (e.g., Functional Servicing Report, grading plans, geotechnical and hydrogeological studies, stormwater management plans). The resulting findings and recommendations from these reports will be briefly discussed in the Scoped EIS, to the extent required to facilitate assessment of the impacts of the proposed development.

## **6. IMPACT ASSESSMENT, MITIGATION IDENTIFICATION AND ENHANCEMENT/ RESTORATION CONSIDERATIONS**

Based on the field studies noted previously, impacts to the significant natural heritage features and functions present on the Subject Lands will be assessed and design modifications will be made, where necessary, to avoid and/or minimize impacts. Appropriate mitigation will be recommended, and if necessary, conceptual compensation to address impacts to natural heritage features will be discussed. This will include an assessment of any setback/vegetation protection zone (VPZ) requirements from natural features on or adjacent to the Subject Lands, including key natural heritage features or key hydrological features located within the portion of the Subject Lands within the Greenbelt Plan area. Potential negative impacts (if any) and residual effects will be identified. Opportunities for enhancements to existing natural features will be identified.

The results of the assessment will be presented in a detailed Impact Assessment table, with additional discussion as necessary to address key points. The Scoped EIS will provide mapping to graphically depict the limits of the conserved features and associated buffers and potential restoration areas (as necessary).

## **7. REPORTING**

A detailed Scoped EIS report will be prepared to document the results of the background review methodology and results of field investigations, agency consultations, assessment of significance and sensitivity of natural features, impact assessment, mitigation and enhancement/restoration.

The Scoped EIS will include the following key components:

- An introductory section outlining the purpose of the report;
- Description of existing regulatory policies (federal, provincial, municipal, NPCA) relevant to the proposed development;
- Outline of the technical methods used to complete ecological field investigations;
- A biophysical inventory (desktop and field data) and analysis (including function assessment, significance determinations in relation to the PPS, 2014, local and regional

Official Plans and identification of key natural heritage features or key hydrologic features located within the Greenbelt area);

- Identification of constraints and opportunities associated with natural heritage features on or adjacent to the Subject Lands;
- Description of the proposed undertaking;
- Impact assessment of the proposed activities including direct/indirect and temporary/permanent and cumulative potential effects;
- Identification of avoidance and mitigation measures to maintain the health, form and function of natural features being protected;
- Opportunities for ecological restoration or enhancement;
- Determination of net effects;
- Identification of any monitoring requirements; and,
- Recommendations and conclusions.

The report will also identify the individuals involved in completing ecological field investigations and EIS analysis.

## References

Bird Studies Canada (BSC) 2003. Marsh Monitoring Program training kit and instructions for surveying marsh birds, amphibians and their habitats. Long Point Bird Observatory and Environment Canada, 41 pp.

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Coururier (eds.) 2007. Atlas of the breeding birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray 1998. Ecological land classification for Southern Ontario: first approximation and its application. Ontario Ministry of Natural Resources, South Central Region, Science Development and Transfer Branch. Technical Manual ELC-005.

Ministry of Municipal Affairs and Housing (MMAH) 2014. Provincial Policy Statement. Available online: <http://www.mah.gov.on.ca/Page10679.aspx>

Niagara Peninsula Conservation Authority (NPCA) 2005. One Mile Creek Watershed Strategy Final Report. Available online: [https://npca.ca/sites/default/files/OneMileCreekWatershedPlan\\_Final2.pdf](https://npca.ca/sites/default/files/OneMileCreekWatershedPlan_Final2.pdf)

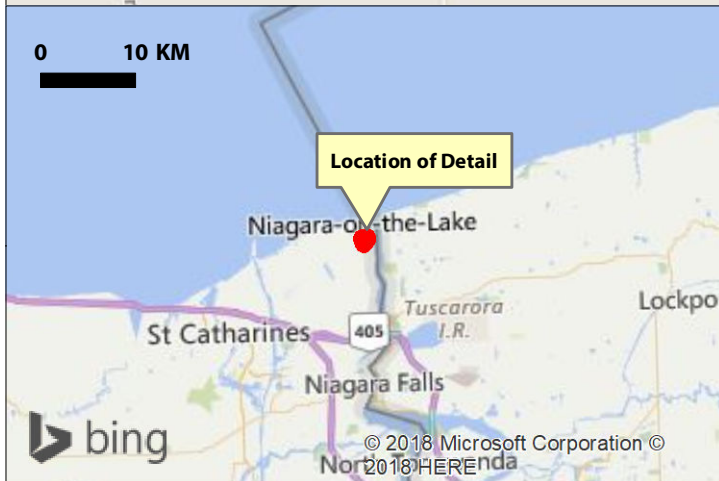
Niagara Region 2012. Environmental Impact Study Guidelines.

Ontario Ministry of Natural Resources (MNR) 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement. Second Edition.

Ontario Ministry of Natural Resources and Forestry (MNRF) 2011. Bats and Bat Habitats: Guidelines for Wind Power Projects. Second Edition.

Ontario Ministry of Natural Resources and Forestry (MNR) 2016. Guelph District's *Bat and Bat Habitat Surveys of Treed Habitats*.

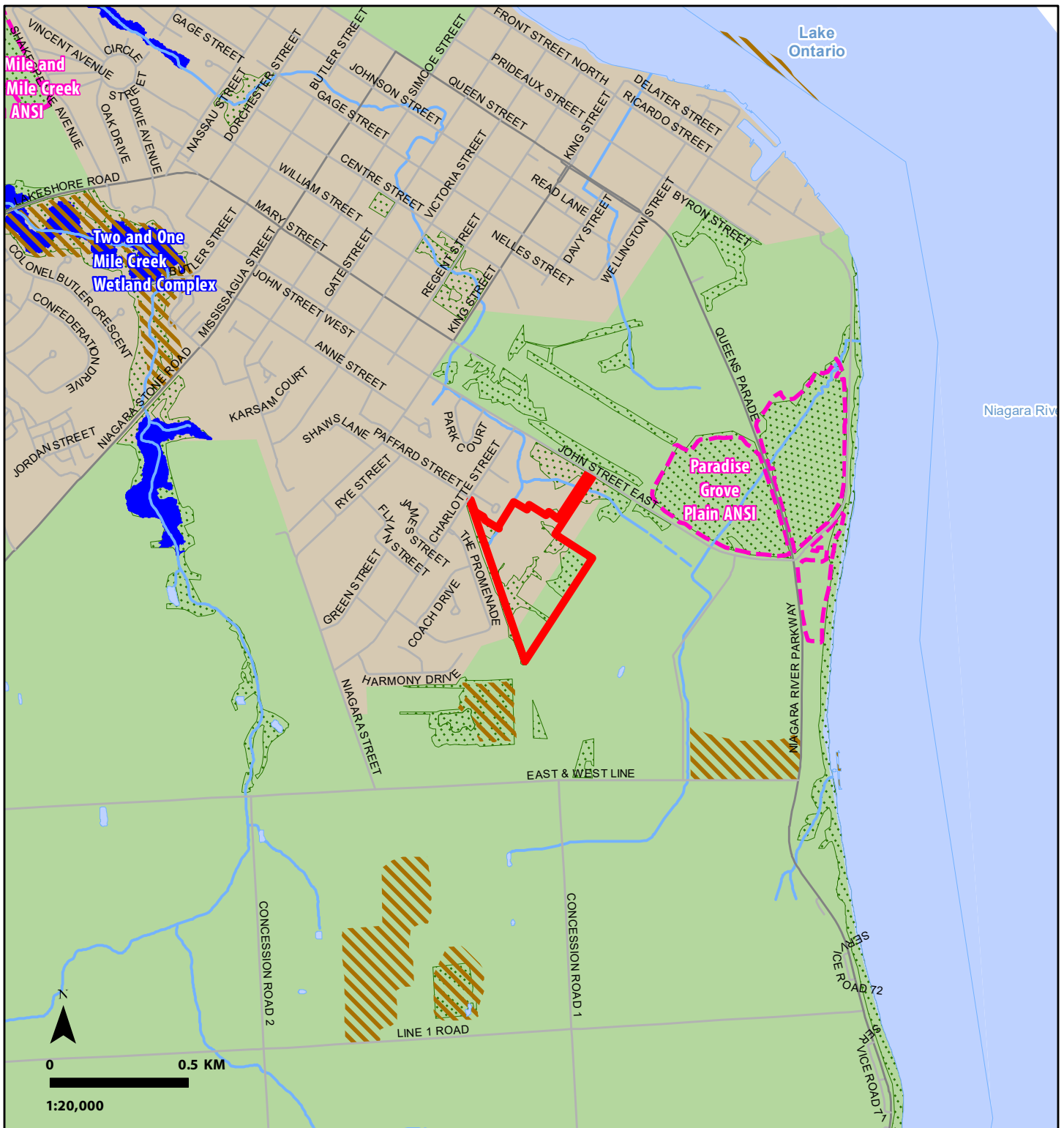
Watt, W.R. and M.C. Caceres 1999. Managing for snags in the Boreal Forests of Northeastern Ontario. Ministry of Natural Resources and Forestry, Northeast Science & Technology. TN-016.



Solmar Niagara on the Lake

Figure 1  
Location of Subject Lands





Solmar Niagara-On-The-Lake

## Figure 2 Landscape Setting

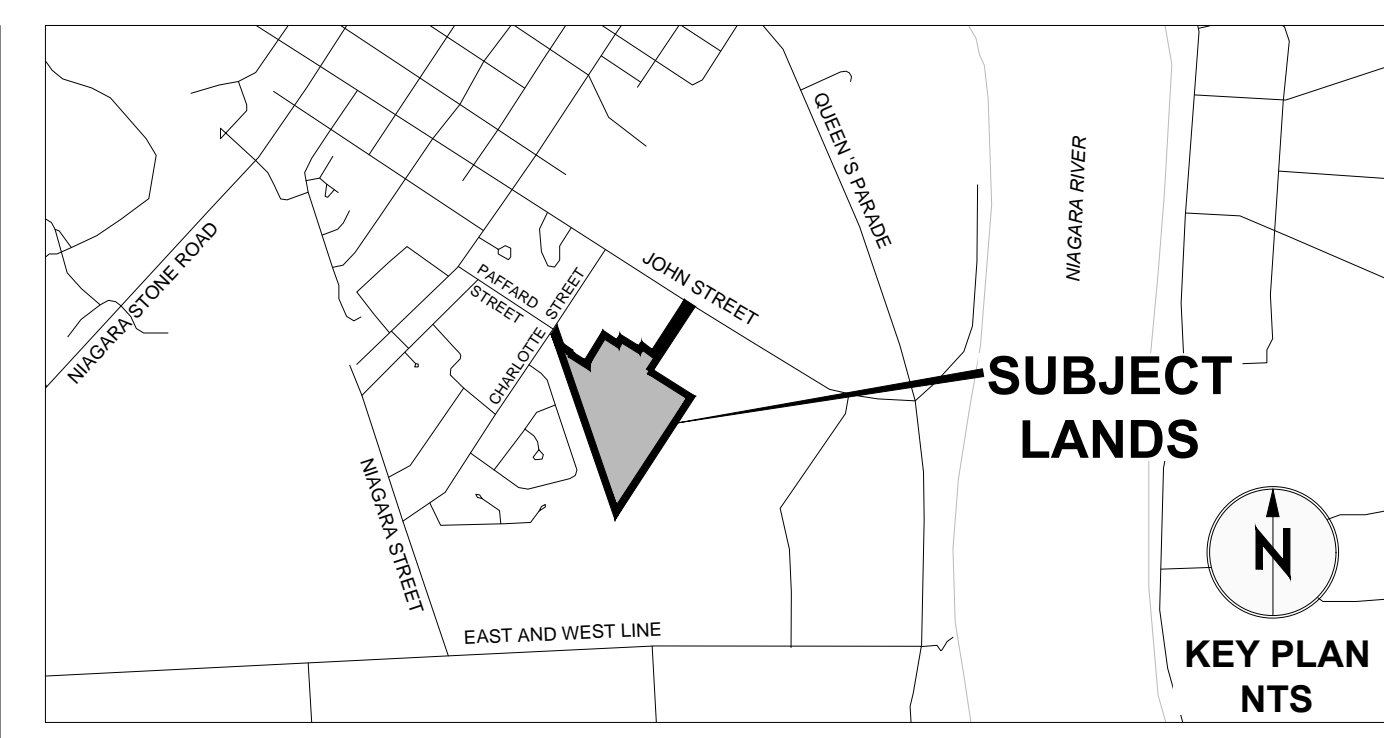
- |   |                        |  |   |
|---|------------------------|--|---|
|  | Subject Lands          |  | Wetland Evaluated-Provincial (MNRF LIO) |
|  | ANSI (MNRF LIO)        |  | Woodland (MNRF LIO)                     |
|  | Waterbody (MNRF LIO)   |  | Deer Wintering Area (MNRF LIO)          |
|  | Watercourse (MNRF LIO) |  | Greenbelt Towns and Villages            |
|   |                        |  | Greenbelt Protected Countryside         |



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**Appendix D – Draft Plan of Subdivision**



**DRAFT PLAN OF SUBDIVISION**  
**SOLMAR**  
 FILE #  
 LOTS 145 and 156  
 REGISTRAR'S COMPILED PLAN 692 and LOT 14  
 PLAN M-11  
 TOWN OF NIAGARA-ON-THE-LAKE  
 REGIONAL MUNICIPALITY OF NIAGARA

**OWNERS CERTIFICATE**  
 I HEREBY AUTHORIZE SGL PLANNING & DESIGN INC. TO SUBMIT THIS PLAN FOR APPROVAL.

SIGNED \_\_\_\_\_ DATE: \_\_\_\_\_  
 Solmar (Niagara 2) Inc.

**SURVEYORS CERTIFICATE**  
 I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE CORRECTLY AND ACCURATELY SHOWN.

SIGNED *Shan Goonewardena* DATE: \_\_\_\_\_  
 SHAN GOONEWARDENA, O.L.S.  
 R-PE SURVEYING LTD

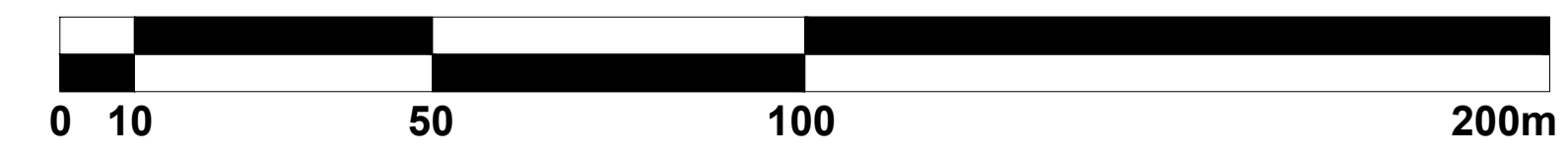
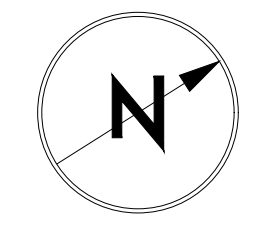
**ADDITIONAL INFORMATION**  
 (UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A,B,C,D,E,F,G,J & L ARE SHOWN ON THE DRAFT AND KEY PLANS.

- H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
- I) SILTY CLAY, SILTY CLAY TILL, SANDY SILT, SANDY SILT TILL
- K) SANITARY AND STORM SEWERS TO BE PROVIDED

LAND USE	LOT / BLOCK #	AREA (ha)	AREA (ac)	UNITS
RESIDENTIAL SEMI DETACHED HOMES	2-34	1.54	3.81	66
RESIDENTIAL SINGLE DETACHED HOMES	1,35-158	4.03	9.96	125
PARK	159 - 160	0.89	2.20	
NATURAL HERITAGE	161	0.17	0.42	
GREENBELT PLAN AREA & EASEMENT	162	3.63	8.97	
STREAM & BUFFER	163	0.12	0.30	
HOTEL	164-165	0.07	0.17	
ROAD & OPEN SPACE	166	0.47	1.16	
WALKWAY	167	0.01	0.02	
ROAD R.O.W.		1.41	3.48	
<b>TOTAL</b>	<b>167</b>	<b>12.34</b>	<b>30.49</b>	<b>191</b>



SCALE 1: 1,000  
 (24x36)  
 July 7, 2020



**Appendix E – CVs**

**Noel Boucher B.Sc. (Env)**

Senior Fisheries Biologist

Noel Boucher is a Senior Fisheries Biologist who specializes in the design and implementation of fisheries studies, fish and fish habitat impact assessment and related permitting for a wide range of project types in the land development, energy and infrastructure industries. He has provided fisheries input to support environmental assessments, environmental impact studies, watershed and subwatershed planning studies, permitting and approvals, constraints assessments and post-construction studies.

Noel has experience with numerous fisheries assessment protocols and techniques, as well as agency expectations regarding fisheries studies in various development sectors. Noel is experienced with the assessment and permitting requirements for aquatic species at risk in Ontario, including Redside Dace, Silver Shiner, American Eel and Lake Sturgeon.

In addition to his technical expertise, Noel is a senior Project Manager, with experience managing projects ranging from small studies to large, multi-disciplinary assessments for complex developments.

PROJECT EXPERIENCE

**Brightwater Development, Port Credit West Village Partners, Mississauga, ON.** Fisheries Biologist and Project Manager for an Environmental Impact Study for commercial/residential redevelopment of a former industrial property on the Lake Ontario shoreline. Completed fish community investigations and managed overall natural heritage studies and impact assessment process.

**Milton Phase 4 Lands Development Process, MP4 Landowners Group, Milton, ON.** Project Manager and Fisheries Biologist representing the Landowner's Group in the municipally led Subwatershed Study for urban development on a 5,260-ha block of rural land. Responsibilities have included completion of aquatic ecological investigations, input to the design of the Natural Heritage System, review and comment on behalf of the Landowner's Group on the Town's Subwatershed Study documentation and participation in the Technical Advisory Committee.

**Britannia West Secondary Plan Area, MP4 (West) Landowners Group, Milton, ON.** Project Manager and Fisheries Biologist representing the Landowner's Group in the municipally led Master Environmental Servicing Plan and Secondary Plan development processes for urban development with a currently rural area. Responsibilities have included completion of aquatic ecological investigations, input to the design of the Natural Heritage System, review and comment on behalf of the Landowner's Group on the Town's study documentation and participation in the Technical Advisory Committee.

**Trafalgar Corridor Secondary Plan Area, Milton P4 Trafalgar Landowners Group Inc., Milton, ON.** Project Manager and Fisheries Biologist representing the Landowner's Group in the municipally led Master Environmental Servicing Plan and Secondary Plan development processes for urban development with a currently rural

EDUCATION

B. Sc., Environmental Science, University of Guelph

EXPERIENCE IN THE INDUSTRY

20 years

EXPERIENCE WITH SAVANTA

4 years

CERTIFICATIONS & TRAINING

MTO/DFO/OMNRF Fisheries Protocol Training

Ontario Class 2 Backpack Electrofishing Certification

Standard First Aid & CPR/AED

area. Responsibilities have included completion of aquatic ecological investigations, input to the design of the Natural Heritage System, review and comment on behalf of the Landowner's Group on the Town's study documentation and participation in the Technical Advisory Committee.

**Boyne Survey Block 1 Subwatershed Impact Study, Block 1 Landowners Group, Milton, ON.** Project Manager for the Subwatershed Impact Study for urban development of a 200-ha block of rural land. Completed agency consultation and managed preparation of project documentation.

**Riverfront Community, GR(CAN) Investments Inc., Niagara Falls, ON.** Fisheries Biologist and Project Manager for an Environmental Impact Study for urban development of a 77-ha greenfield site. Participated in environmental impact study documentation, ecological field investigations and agency consultation.

**Britannia West Secondary Plan Area, MP4 (West) Landowners Group, Milton, ON.** Project Manager and Fisheries Biologist representing the Landowner's Group in the municipally led Master Environmental Servicing Plan and Secondary Plan development processes for urban development with a currently rural area. Responsibilities have included completion of aquatic ecological investigations, input to the design of the Natural Heritage System, review and comment on behalf of the Landowner's Group on the Town's study documentation and participation in the Technical Advisory Committee.

**Industrial Lands Development, 678604 Ontario Inc., Mississauga, ON.** Fisheries Biologist and Project Manager for an Environmental Impact Study for a proposed industrial development on an existing agricultural property. Completed aquatic ecological studies, participated in agency consultations including meetings and field visits and managed overall natural heritage studies and impact assessment process. Currently completed MECP discussions under the *Endangered Species Act* to ensure all requirements associated with regulated Redside Dace habitat are met.

**Wasauksing Bridge Ecological Studies, Wasauksing First Nation, ON.** Fisheries Biologist for the completion of environmental studies and permitting for a new replacement bridge over a channel in Georgian Bay. Completed scoping of field studies and assessment of potential effects of various bridge alignment options. Currently providing input to ongoing aquatic permitting processes.

**South Wellington Lands Development, The Stronach Group, Aurora, ON.** Fisheries Biologist and Project Manager for an Environmental Impact Study for residential development of an existing property with a mix of land uses. Completed aquatic ecological studies including headwater drainage feature assessment and fish community surveys, participated in agency consultations including meetings and field staking events and managed overall natural heritage studies and impact assessment process.

**Jeffery Property Residential Development, Delpark Homes, Port Perry, ON.** Fisheries Biologist and Project Manager for an Environmental Impact Study for residential development of an existing agricultural property. Completed aquatic ecological studies, participated in agency consultations including meetings and field staking events and managed overall natural heritage studies and impact assessment process.

**Mill Pond EA, Town of Richmond Hill, Richmond Hill, ON.** Senior Fisheries Biologist and Project Manager for natural heritage input to the Class Environmental Assessment to assess options for upgrades to the Mill Pond property, including potential stormwater management pond upgrades, trail realignments/upgrades, channel realignment and pond mitigation. Scoped aquatic field studies including trap netting, electrofishing and habitat assessment.

**Whitlock Bridge Environmental Permitting, Milton Phase 3 Landowner's Group, Milton, ON.** Fisheries Biologist and Project Manager for provision of ecological assistance to address permitting requirements under the *Endangered Species Act* (for Silver Shiner), Conservation Authority regulation and *Fisheries Act* for an approximately 180-m long bridge over the Sixteen Mile Creek valley.

**Confidential Aggregate Pit Expansion Project, ON.** Fisheries Biologist responsible for design and implementation of baseline fish and fish habitat assessment program and completion of fish habitat impact assessment for documentation in the Level I/II Natural Environment Technical Report.

**Lathrop Pond Decommissioning and Restoration Project, Nature Conservancy of Canada, Pelham, ON.** Fisheries Biologist and Project Manager for the design and implementation of a restoration project to decommission and restore two anthropogenic online ponds in the headwaters of a coldwater stream.

Completed fish and fish habitat investigations, managed natural heritage studies, participated in the design of conceptual restoration options and completed pre-consultation with agencies.

**Hallstone Road Storm Sewer Bypass Project, Kaneff Group of Companies, Brampton, ON.** Fisheries Biologist and Project Manager for an infrastructure project involving the construction of a new storm sewer to bypass an existing online golf course pond. Completed aquatic field studies, prepared Environmental Impact Study documentation and addressed all requirements under the *Fisheries Act* and *Endangered Species Act*.

**Hunt Club Pond Decommissioning and Restoration, Hunt Club Partners Inc., Cambridge, ON.** Managed the successful application for an Authorization under the *Fisheries Act* to permit decommissioning of an online pond and restoration of the former pond area with a natural channel and restored riparian habitat. Secured a Letter of Advice from DFO to replace an existing CSP culvert with a larger open-bottom structure that will enhance upstream fish passage.

**West Gormley Sanitary Sewer Expansion, DG Group, Richmond Hill, ON.** Fisheries Biologist responsible for discussions with DFO and MNR to obtain clearance under the *Fisheries Act* and *Endangered Species Act* for a proposed sanitary sewer construction project in Redside Dace contributing habitat.

**Park Place Phase 2, Country Green Homes, Waterdown, ON.** Fisheries Biologist and Project Manager for an Environmental Impact Study to assess effects and mitigation requirements for realignment of a watercourse and installation of servicing for a proposed residential development. Completed agency discussions (City of Hamilton, Hamilton Conservation Authority, MNR) and Environmental Impact Study documentation.

**4050 Yonge Street, 2432014 Ontario Inc., Toronto, ON.** Fisheries Biologist for the permitting for a shoreline and slope stabilization project on the Lower West Don River to support a commercial/hotel development on the adjacent tablelands. Completed a DFO Request for Review package and obtained confirmation that no authorization under the *Fisheries Act* was required. Provided input to the fish and fish habitat mitigation tender specifications and drawings.

**Mary Fix and Levi Creek Erosion Risk Mitigation Project, City of Mississauga, ON.** Fisheries Biologist providing input to the Class Environmental Assessment and *Fisheries Act/Endangered Species Act* review processes for proposed channel upgrades to address ongoing erosion in two urban creeks. Completed DFO Request for Review packages for each creek and obtained confirmation that no authorizations under the *Fisheries Act* were required.

**13330 Dufferin Street, 632025 Ontario Ltd., King Township, ON.** Fisheries Biologist and Project Manager for an Environmental Impact Study for a proposed urban development on a currently agricultural property in the Oak Ridges Moraine. Requirements included assessment of development limits and potential effects on a watercourse and significant wetland associated with upgrades of an existing farm lane road crossing. Currently proceeding with permitting discussions with DFO and MECP.

**Block 18 SWM Pond Fish Removal, Landowners Group, Vaughan, ON.** Fisheries Biologist and Project Manager for the completion of a fish salvage operation in two stormwater management ponds prior to pond clean-out activities. Fish salvage resulted in collection of over 10,000 fish from two ponds in an urban settlement area.

**Shickluna Hydro Development, St. Catharines Hydro, St. Catharines, ON.** Fisheries Biologist and Project Manager for revisions to *Fisheries Act*, *Endangered Species Act* and Conservation Authority permit applications for a proposed small hydroelectric development on Twelve Mile Creek.

**Cochrane Solar Project, Northland Power Inc., Cochrane, ON.** Project Manager for the completion of Renewable Energy Approval amendment for the existing Cochrane Solar Project. The amendment was required for construction and operation of a new access road and water crossing. Amendment required revised study documentation, impact assessment and public notification.

#### PREVIOUS PROJECT EXPERIENCE

**Hilton Falls Diversion Dyke Upgrade Project, Conservation Halton, Milton, ON.** Project Manager for the completion of the Conservation Ontario Class Environmental Assessment process for upgrades to an existing

diversion dam in a Conservation Area. Completed ecological investigations, agency, public and Indigenous community consultation and all Class EA documentation requirements.

**Shickluna Hydro Development, St. Catharines Hydro, St. Catharines, ON.** Fisheries Biologist and Project Manager for the Environmental Screening for a proposed 4 MW hydroelectric facility on Twelve Mile Creek. Completed fish community and fish habitat studies, agency, public and Indigenous consultation, provided aquatic input to design of a natural bypass fishway and completed all Environmental Assessment requirements.

**Chaudière Hydro Project, Energy Ottawa, Ottawa, ON.** Fisheries Biologist for the Environmental Effects Determination and permitting and approvals for a proposed 26 MW redevelopment of an aging hydroelectric facility on the Ottawa River. Completed agency consultation, provided aquatic input to the Environmental Effects Determination and design of downstream eel passage facilities and prepared application for *Fisheries Act* Authorization.

**20 Solar Projects in Southern Ontario, Recurrent Energy, ON.** Project Manager for the Renewable Energy Approval application process for 20 solar projects throughout Southern Ontario. Completed stakeholder consultation, waterbody assessment reports and management completion of all application materials.

**Gull Bay Shoreline Stabilization Project, Ontario Power Generation, Gull Bay First Nation, ON.** Fisheries Biologist and Project Manager for the environmental permitting and community consultation for a shoreline stabilization project, including opening of a new rock quarry for source material. Completed applications under *Fisheries Act*, *Aggregate Resources Act* and *Endangered Species Act* (Eastern Whip-poor-will).

**Darlington Deepwater Characterization, Ontario Power Generation, Bowmanville, ON.** Fisheries Biologist and Project Manager for the baseline aquatic ecological studies to assess potential water intake locations for an expanded nuclear facility on the Lake Ontario shoreline. Fisheries studies included habitat assessment, fish community assessment (adult netting, larval trawling), water quality and zooplankton studies.

**Kabinakagami River Hydro Development, Northland Power Inc., Kabinakagami First Nation, ON.** Fisheries Biologist and Project Manager for the Class Environmental Assessment for four proposed small hydroelectric facilities on the Kabinakagami River in northern Ontario. Completed fish community, spawning, tagging/tracking and fish habitat studies, agency, public and Indigenous consultation, provided aquatic input to design of a fish habitat compensation and completed all Environmental Assessment requirements.

**Umbata Falls Hydroelectric Development, Innergex Power Corporation, Marathon, ON.** Fisheries Biologist for the environmental screening and permitting for a greenfield hydroelectric facility on the Umbata River in northern Ontario. Completed fish community, spawning, and fish habitat studies, and provided aquatic input to the Environmental Assessment requirements. Completed three years of post-construction monitoring to confirm and verify predicted impacts.

#### PROFESSIONAL AFFILIATIONS

American Fisheries Society

#### PRESENTATIONS

Boucher, N., Heaton, M. and A. Watt, 2019. Natural Channel Design for an Aquatic Species at Risk vs. Nature's Engineer: Case Study of Mount Pleasant, Brampton. At *Latornell Conservation Symposium*, Orillia, Ontario. November 21, 2019.

# Barbara Charlton

## Ornithologist

bcharlton@savanta.ca

Barbara Charlton has been an avid birder and naturalist for over 30 years. She has volunteered countless weeks of fieldwork, conducting bird population censuses, and band re-sighting with the Western James Bay Shorebird Project, banding birds, and migration monitoring at the Long Point Bird Observatory, as well as surveying breeding birds with both of the Ontario Breeding Bird Atlas projects. She has extensive field experience identifying and inventorying birds, performing point counts, breeding bird, and nesting surveys.

### Ornithology

During her three years with Savanta, Barbara has conducted Breeding Bird Surveys based on the protocol set forth by the Ontario Breeding Bird Atlas (OBBA, 2001), the Forest Bird Monitoring Program (CWS, 2005) and the Marsh Monitoring Program (BSC, 2003), which include point counts and area searches. Emphasis was placed on breeding evidence of Species at Risk, including Bobolink, Eastern Meadowlark and Barn Swallow. Additional work included Species at Risk habitat assessment and incidental wildlife observations.

Barbara currently serves as Assistant Secretary for the Ontario Bird Records Committee and has been a reviewer since 2011, for Hamilton and Halton regions, for Ebird Ontario. Barbara has served on several Boards of Directors, including Bird Studies Canada and for 2 years she coordinated Ontario volunteers for the Breeding Bird Survey.

Although Barbara did some bird banding in James Bay at the Hannah Bay field camp in 2013, the majority of her bird banding experience comes from spending many vacation weeks volunteering at the Long Point Bird Observatory. During this time she became experienced at banding birds, extracting birds from mist nets, ageing, sexing and weighing.

Barbara participated in both Breeding Birds Atlas Projects, working in her local area as well as assisting with squares requiring additional coverage, including the Bruce Peninsula. She continues to participate in various Christmas Bird Counts and NABA Butterfly Counts, as she has for decades.

In her leisure time Barbara has birded Canada from British Columbia to the Maritimes, many states in the U.S. including California, Arizona, Colorado, Florida and Texas, as well as the Caribbean.

### Select Project Experience

- Ontario Bird Records Committee Assistant Secretary
- Ebird Ontario Reviewer, Hamilton and Halton



- Western James Bay Shorebird Project Volunteer, Shorebird census and band re-sighting: Hannah Bay, Londridge Point, Little Piskwamish, North Bluff Point
- Ontario Breeding Bird Atlas Participant
- Ontario Breeding Bird Survey, Ontario Coordinator of BBS Volunteer Surveyors
- Christmas Bird Counts, Long Point, St. Catharines, Hamilton, Niagara, Kitchener, Cambridge
- NABA Butterfly Counts, Hamilton, Long Point, Point Pelee
- Bird Banding, Long Point Observatory: The Tip, Breakwater, Old Cut, Clear Creek Raptor Station
- Ottawa Banding Group: Andros Island, Bahamas
- Thunder Cape Bird Observatory: Sleeping Giant Provincial Park, Thunder Bay

### Education

- B.A., Trent University

### Certification and Training

- Wilderness First Aid
- Basic Life Support CPR Provider A

### Board of Directors

- Bird Studies Canada (1988 – 1993)
- Ontario Bird Banding Association (1988 – 1993)
- Kitchener Waterloo Field Naturalists – Board of Directors (1987 – 1992), Membership Director (1987 – 1989), President (1989 – 1990)

### Employment History

- Savanta, Inc., 2011 - Present
- 604688 Ontario Inc., 2009 – Present
- Ontario Ministry of Transportation, 1984 - 2009

**Megan Green, B.Sc., CERPIT**

Ecologist

Megan has experience managing and conducting ecological studies, impact assessments and restoration projects in a variety of sectors. As an Ecologist, Megan is highly integrated between practice areas and performs a variety of terrestrial and aquatic ecological inventories evaluating the significance and sensitivity of natural heritage features and their associated functions on local and regional scales. She has extensive knowledge related to aquatic ecology and ecosystem restoration. Megan has experience coordinating regulatory approvals required by local, provincial and federal agencies including Fisheries and Oceans Canada, the Ministry of Natural Resources and Forestry and the Ministry of Environment, Conservation and Parks.

In her role as a Project Manager, Megan manages a comprehensive portfolio of projects across multiple sectors (e.g., natural heritage, energy and restoration) throughout Southern Ontario. She has managed and authored Environmental Impact Studies and various other environmental reports, as directed in official planning documents and the Provincial Policy Statement. Megan has demonstrated a high degree of competency in the interpretation of planning policy, and assessing natural heritage features and functions. Megan routinely liaises with reviewing agencies, such as conservation authorities, associated municipalities and other parties, on behalf of her clients.

PROJECT EXPERIENCE

**River Road West Development Environmental Impact Study (EIS), Farsight Homes, Wasaga Beach, ON.** Project Manager – Completed baseline studies in support of site development. Completed an impact assessment based on development limits in support of the municipal planning application and outlined preliminary restoration concepts.

**Bowmanville Severance Scoped Environmental Impact Study, Vanstone Mill Inc., Bowmanville, ON.** Project Manager – Completed baseline studies in support of a lot severance application. Provided policy direction pertaining to the delineation and protection of natural heritage features and functions.

**Ninth Line Lands Scoped Environmental Impact Study, Mattamy Development Corporation, Mississauga, ON.** Project Manager and Field Lead – Completed aquatic and terrestrial studies to inform Scoped EIS and identification of species at risk and wetland compensation opportunities.

**Renewable Energy Approval (REA) Amendment: Brockville and Beckwith Solar Projects, ENGIE, Township of Elizabethtown-Kitley and Town of Mississippi Mills, ON.** Project Manager – Completed REA amendment application packages for each project, including completion of impact assessment, stakeholder notifications and preparation of application materials.

**Pin Oak Drive Property Environmental Impact Study, Penta Properties, Niagara Falls, ON.** Project Coordinator and Field Lead – Completed baseline studies to inform EIS. Reviewed natural heritage features present on the property based on municipal and provincial

EDUCATION

Post-Graduate Certificate, Ecosystem Restoration, Niagara College (2016)  
B.Sc., Biology, University of Victoria (2013)

EXPERIENCE IN THE INDUSTRY

3.5 years

EXPERIENCE WITH SAVANTA

3.5 years

REGISTRATIONS/CERTIFICATIONS

Certified Ecological Restoration Practitioner in Training (CERPIT)  
Certified Environmental Professional in Training (EPT)  
Ontario Stream Assessment Protocol (OSAP) Headwater Drainage Feature Technical Training  
Ontario Benthos Biomonitoring Network  
Class 2 Electrofishing Backpack Crew Leader  
PADI Advanced Scuba Diving Certification  
Emergency First Aid with CPR "C" + AED  
Workplace Hazardous Materials Information System (WHMIS)

criteria. Identified constraints to development and potential restoration opportunities.

**Lathrop Property Pond Decommissioning, Nature Conservancy of Canada, Pelham, ON.** Field Lead and Technical Contributor – Completed baseline studies to inform ecological restoration concepts in support of the proposed pond decommissioning. Targeted improvements to downstream water quality to promote the expansion of Brook Trout populations, embankment stability and pedestrian access.

**Henvey Inlet First Nation Wind Project, Henvey Inlet First Nation, Pickering, ON.** Environmental Abatement Officer and Supervisor - Facilitated the consistent implementation of Environmental Permit requirements. Incorporated indigenous knowledge into the environmental process to avoid adverse environmental effects. Upheld environmental protection laws and standards.

**Elgin Mills Greenway Natural Heritage System Design Brief, Town of Richmond Hill, Richmond Hill, ON.** Technical Contributor – Prepared ecological restoration plan to enhance lands impacted by stormwater management facility improvements in support of a Natural Heritage System Design Brief.

**Patterson Creek Riparian Restoration Plan, Lawrence Thomas (Private Landowner), Richmond Hill, ON.** Restoration Advisor – Prepared and implemented riparian restoration plan within contributing Redside Dace habitat, including use of bioengineering opportunities.

#### PROFESSIONAL AFFILIATIONS

Society for Ecological Restoration

**Christopher Zoladeski, Ph.D.**

Botanist, Senior Ecologist

Chris has over 30 years of environmental consulting experience on projects ranging from biological surveys to comprehensive natural heritage strategies and sustainable forestry audits. He has extensive knowledge of forest, wetland and applied plant ecology, Ecological Land Classification and flora of southern, central and northern Ontario.

Chris implements conservation biology principles in the development of biodiversity, watershed and natural heritage policy planning. He has numerous ecological surveys and Environmental Impact Assessments including habitat restoration, species at risk management and wetland delineation for projects ranging from housing and golf course developments to comprehensive assessments of aggregate sites.

PROJECT EXPERIENCE

**Heritage Heights Secondary Plan Area, Mattamy Homes, Northwest Brampton, Ontario.** Lead botanist in the comprehensive survey of the area. Conducted botanical and vegetation surveys of all terrestrial and wetland habitat types using the Ecological Land Classification system for Ontario. Developed the major components of the Natural Heritage System.

**Subwatershed Study and Impact Assessment, Block 51-1 Mount Pleasant Community, Mattamy Homes, Northwest Brampton, Ontario.** Lead botanist and vegetation ecologist in the multidisciplinary survey and analysis of proposed development lands. Conducted multi-year monitoring surveys of restored Natural Heritage System components, including exotic and invasive species, habitat changes and impacts and vegetation mapping.

**Boyne Secondary Plan Area, various developers and landowners, South Milton, Ontario.** Completed comprehensive botanical and vegetation surveys and assessments to create foundations of a Natural Heritage System design for the area. Proposed monitoring programs for the areas adjoining new development. Completed mapping surveys of major exotic and invasive plant species.

**Britannia West and Trafalgar Corridor Development Areas, various landowners, Milton, Ontario.** Completed large scale vegetation mapping surveys to identify constraints and opportunities for development. Conducted delineations of upland and wetland areas, including multi-year vernal pool mapping and dynamics analysis.

**Wetland Monitoring, Hunt Club Inc., Cambridge, Ontario.** Conducted multi-year monitoring of wetland vegetation and plants at strategically selected locations using permanent plots and transects. The purpose was to detect any adverse changes in wetland ecosystems due to ongoing construction in the vicinity. The project is an element of a suite of monitoring initiatives to assess the health of ecosystems and hydrological components.

EDUCATION

Ph.D., Botany, University of Toronto  
M.Sc., Forest Ecology and Soil Science,  
Laval University

EXPERIENCE IN THE INDUSTRY

30 years

EXPERIENCE WITH SAVANTA

12 years

REGISTRATIONS/CERTIFICATIONS

Butternut Health Assessment Certificate  
Environmental Impact Study Training  
Session, Ontario Ministry of Natural  
Resources

Ecological Land Classification Training  
Course

Ontario Wetland Evaluation System  
Training Course

**Waterdown to Finch Pipeline, Imperial Oil, Ontario.** Part of a multi-disciplinary team to map the natural heritage system components within the proposed corridor, including species at risk. Completed extensive arborist surveys of potentially impacted areas to identify compensation needs.

**Environmental Impact Studies, various clients, throughout the Greater Toronto Area.** Conducted numerous botanical and vegetation surveys for projects ranging from housing and industrial developments to golf courses and strategic natural heritage systems designs, incorporating ELC mapping, wetland delineations and constraints analyses.

**Pilot Grassland Restoration Project, Ontario Aggregate Resources Corporation and Ontario Ministry of Natural Resources, Ontario.** Conducted surveys and assessments of potential sites for establishing or restoring tall grass prairie in southern Ontario. Developed revegetation plans for the donor sites including the types of potential plant communities, species mixes, site preparation and management recommendations.

**Lake Erie Sand Spit Savannas and Species at Risk: Invasive Species Inventory and Vegetation Restoration Strategy, Ontario Ministry of Natural Resources, Canadian Wildlife Service, Walker Industries, and LESSS Recovery Team.** Conducted extensive surveys of invasive plant species at selected Lake Erie shoreline sites, which included detailed mapping of species presence and abundance. Based on this information, an invasive species management strategy was proposed, including species threat and invasiveness rankings and prioritization of sites for targeted species control. Invasive plant species factsheets were developed to assist the park's and natural areas managers and public with identification of species and strategies for their control.

**Cherry Birch Recovery Strategy, Ontario Ministry of Natural Resources.** Analyzed the current status of Cherry Birch extant populations in Ontario and developed a comprehensive strategy for recovery of the species in the province.

**State of Aggregate Resources in Ontario Study: Paper 6 – Rehabilitation, Field Assessments, Ontario Ministry of Natural Resources.** Completed extensive surveys of aggregate (sand, gravel, stone) sites in southern Ontario with the objective to identify opportunities for ecological rehabilitation using native vegetation.

#### PREVIOUS PROJECT EXPERIENCE

**Sustainable Forest License Audits, Ontario Ministry of Natural Resources.** As part of multi-disciplinary teams of biologists, foresters and economists, conducted audits of forest license operators in northern Ontario to assess the operations from the economic and ecological sustainability perspectives and regulatory requirements.

**Pipeline expansion developments, TransCanada Pipelines, Ontario.** Conducted assessments of pipeline sites to ensure regulatory compliance for vegetation, species and fisheries and stream crossings, based on available information and surveys.

**Ecosystem Classification for the southeast Yukon, Yukon Government and Environment Canada.** Based on extensive field surveys developed a system to classify and map terrestrial, forest and wetland vegetation types to be used by natural resource managers and forestry practitioners in the Territory.

**Forest Ecosystem Classification for Manitoba, Environment Canada and Manitoba Ministry of Natural Resources.** Was the lead author of forest ecosystem classification specific to the province. The system was based on information available from literature, government sources and collected during targeted surveys of forest and soil sites.

#### PUBLICATIONS

##### Books:

Zoladeski, C.A., Delorme, R.J., Wickware, G.M., Corns, I.G.W. and Allan, D.T. 1998. Forest ecosystem toposequences in Manitoba. Special Report 12, Canadian Forest Service, Northern Forestry Centre, Edmonton, Alberta, 63p.

Zoladeski, C.A., Cowell, D.W. and Ecosystem Classification Advisory Committee. 1996. Ecosystem classification for the southeast Yukon: field guide, first approximation; Yukon Renewable Resources,

Canadian Forest Service, Department of Indian and Northern Affairs and Northern Development, Whitehorse, Yukon, 409p.

Zoladeski, C.A., Wickware, G.M., Delorme, R.J., Sims, R.A. and Corns, I.G.W. 1995. Forest ecosystem classification for Manitoba: field guide, special report 2; UBC Press, Vancouver, B.C., 205p.

**Articles in Periodicals:**

Zoladeski, C.A. 1991. Vegetation zonation in dune slacks on the Leba Bar, Polish Baltic Sea coast; *Journal of Vegetation Science*, v.2, p.255-258.

Zoladeski, C.A. and Maycock, P.F. 1990. Dynamics of the boreal forest in northwestern Ontario; *American Midland Naturalist*, v.124, p.289-300.

Zoladeski, C.A. 1989. Current status of rare vascular plants on Cape Enragé (Bic), Quebec; *Le Naturaliste canadien*, v.116, p.113-116.

Zoladeski, C.A. 1988. New station for *Malaxis paludosa*, bog adder's-mouth orchid, in northwestern Ontario; *The Canadian Field-Naturalist*, v.102, p.548-549.

Zoladeski, C.A. 1988. Classification and gradient analysis of forest vegetation of Cape Enragé, Bic Park, Quebec; *Le Naturaliste canadien*, v.115, p.9-11.