

**ENVIRONMENTAL IMPACT STUDY UPDATE**

**HUNTINGWOOD TRAILS**

**TOWN OF COLLINGWOOD**

**PREPARED FOR:**

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| Revision Number | Date      | Comments                          |
|-----------------|-----------|-----------------------------------|
| Rev. 0          | July 2019 | Environmental Impact Study Update |

## 1.0 Executive Summary

CF Crozier & Associates Inc. (Crozier) was retained by **Huntingwood Trails (Collingwood) Ltd.** (the "Proponent") to undertake an Environmental Impact Study (EIS) update in connection with the planning applications for the redevelopment of the site located at **Parts of Lots 47, 48 and 49 Concession 12** in the **Town of Collingwood**. This EIS update is provided to address any changes to the existing conditions of the natural environment and to provide additional natural heritage data collected since the completion of the EIS completed by Hensel Design Group Inc. (HDG) in 2011 in connection with the approved Official Plan Amendment for the site.

The purpose of the study is to evaluate the impacts of the proposed development on the natural heritage features and functions and to recommend any required mitigation measures if warranted, and to address policy and statutory requirements with respect to Species At Risk. The EIS update addresses the Official Plan requirements as approved by the OMB on July 31, 2014. Section 4.3.4.5.8.13 e and 4.3.4.4.5.8 e respectfully for Development Area #1 and Development Area #2 states:

- e. *On the basis of the designation and dedication of these lands identified in hatching, it is confirmed that no further natural heritage studies or buffers are required. Despite this policy, in addition to whatever studies are identified as required by Section 8.13, current and future Planning Act applications shall be supported by:*
  - i. *details demonstrating that the proposed development mitigates any negative impacts on the natural heritage features or their ecological functions through appropriate measures to the satisfaction of the Town and the NVCA;*
  - iii. *details demonstrating that the proposed development satisfies the requirements of the Provincial Policy Statement and the Endangered Species Act with respect to species at risk.*

The development proposes the following elements:

- Residential development
- Stormwater Management facilities
- Naturalization and habitat enhancements to mitigate potential impacts

The analysis contained within this report was prepared using the most recent Draft Plan of Subdivision (July 23, 2019). Any minor revisions to the Draft Plan are not expected to affect the conclusions contained within this report.

Our review has concluded that the development proposal is feasible from an environmental prospective in so long as the mitigation measures outlined herein are implemented.

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## 2.0 Introduction

CF Crozier & Associates Inc. (Crozier) was retained by **Huntingwood Trails (Collingwood) Ltd.** (the "Proponent") to undertake an update to the Environmental Impact Study (EIS) prepared by Hensel Design Group Inc. in 2011 in connection with the rezoning and subdivision planning applications for the redevelopment of the site located at **Parts of Lots 47, 48 and 49 Concession 12** (the "site") in the **Town of Collingwood**.

Previous field studies were completed in 2010 by Hensel Design Group Inc. and documented in an EIS in 2011 (HDG, 2011). Since 2011 there have been additional Species At Risk (SAR) identified both Federally and Provincially and new field study protocols have been identified including the study of Bats and Turtles. As such, it was recommended that an update to the 2011 EIS be completed for use during the Draft Plan submission and review process.

The EIS is also required to address the Official Plan requirements as approved by the OMB on July 31, 2014. Section 4.3.4.5.8.13 e and 4.3.4.4.5.8 e respectfully for Development Area #1 and Development Area #2 states:

- e. *On the basis of the designation and dedication of these lands identified in hatching, it is confirmed that no further natural heritage studies or buffers are required. Despite this policy, in addition to whatever studies are identified as required by Section 8.13, current and future Planning Act applications shall be supported by:*
  - i. *details demonstrating that the proposed development mitigates any negative impacts on the natural heritage features or their ecological functions through appropriate measures to the satisfaction of the Town and the NVCA;*
  - iii. *details demonstrating that the proposed development satisfies the requirements of the Provincial Policy Statement and the Endangered Species Act with respect to species at risk.*

## 2.1 Site Location and Characterization

The subject lands are described as a portion of Part of Lots 47, 48 and 49, Concession 12, Town of Collingwood, County of Simcoe. The subject lands are 48.97ha in size and are located between residential development on both the east and west sides. To the north of the subject lands is Highway 26 West and a residential development. To the south is the Georgian Trail and undeveloped land (See Figure 1). The subject lands were historically used for agricultural uses and a portion remains in use as pasture lands for cattle.

The Silver Creek bisects the subject lands and flows south to north outletting approximately 1km from the subject lands into Georgian Bay. Vegetation on the east side of the subject lands is primarily pasture with fragmented wooded areas on the west side of Silver Creek. Vegetation along Silver Creek ranges from being mown pasture at the edge of the creek to providing light tree cover in other areas. The remaining lands abutting the Georgian Trail and adjacent Silver Creek Preserve Development are a mixture of woodland/wetland with successional open areas.

## 2.2 Study Goals and Objectives

The purpose of this EIS update is to provide an updated inventory of the physical and ecological characteristics of the natural heritage features on the subject lands including the

functions, significance and sensitivity, including Species At Risk. Additionally, this report will address potential impacts to these features and outline how impacts can be minimized or mitigated. In consideration of this information, recommended protection and/or mitigation measures will ensure that the proposed development conforms to the requisite policies as outlined herein.

The policies and technical requirements of the Official Plans for the Town of Collingwood and the County of Simcoe as well as the Provincial Policy Statement (PPS) have been considered as part of this study. With respect to Species At Risk, the *Endangered Species Act* and *Species At Risk Act* have also been considered.

The goal of this EIS is to provide the following:

- a) Ensure that the proposed development can proceed in a manner that will not result in negative impacts to significant ecological features and functions.
- b) Demonstrate conformity or consistency, as appropriate, to the Provincial Policy Statement, the County of Simcoe Official Plan, the Town of Collingwood Official Plan and the *Conservation Authorities Act*.

The specific objectives that will be completed as part of this EIS include the following:

- Provide an evaluation of the ecological features and functions of the subject lands through detailed background review and field investigations;
- Identify and map any and all significant features (i.e. any significant habitat for Species at Risk), key ecological attributes, and sensitivities of the subject lands;
- Complete a detailed assessment of potential impacts to natural heritage features;
- Identify appropriate mitigation that minimizes the potential impact of each component of the development proposal; and
- Assess long term and cumulative effects of the proposed development along with adjacent land uses.

### **2.3 Background Reports**

As part of the subject land assessment, available relevant reports were reviewed for information relating to natural heritage features and functions of the subject lands. This included the Functional Servicing Report and Stormwater Management Report, Natural Hazards Study and Traffic Impact Study, all prepared by Crozier and Associates in 2001 and updated July 2019.

## **3.0 Natural Heritage Policy**

Provincial and municipal planning policies guided the preparation of natural heritage constraints and opportunities for the proposed development on the subject lands. Existing background policy information sources were reviewed to identify any mapped natural heritage features that may occur on or within 1km of the subject lands. In addition, a review of background data from various sources pertaining to the subject lands and adjacent lands was also completed. These policies and background information sources include:

- a) Ontario Provincial Policy Statement (2014);
- b) County of Simcoe Official Plan (2016);
- c) Town of Collingwood Official Plan (2019);
- d) Nottawasaga Valley Conservation Authority - Ontario Regulation 172/06 (2013)

- e) Ministry of Natural Resources Natural Heritage Reference Manual (2010) and the Significant Wildlife Habitat Technical Guide (2000);
- f) Ontario Natural Heritage Information Centre database (2019) ([www.nhic.mnr.gov.on.ca](http://www.nhic.mnr.gov.on.ca));
- g) The Ontario Breeding Bird Atlas ([www.birdsontario.org](http://www.birdsontario.org));
- h) The Species At Risk Public Registry ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca));
- i) Ontario *Endangered Species Act* (2007);
- j) Federal *Species At Risk Act* (2002);
- k) Aerial photographs.

### 3.1 Provincial Policy Statement (PPS)

The Provincial Policy Statement addresses the protection of Natural Heritage Features in relation to development.

According to the Provincial Policy Statement (2014), various provincially defined natural features shall be protected for the long term. Relevant sections state:

“2.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of *natural heritage systems*, should be maintained, restored or, where possible, improved, recognizing linkages between and among *natural heritage features and areas, surface water features and ground water features*.

2.1.4 *Development and site alteration shall not be permitted in:*  
a) *significant wetlands in Ecoregions 5E, 6E and 7E, and*  
b) *significant coastal wetlands*

2.1.5 *Development and site alteration shall not be permitted in:*  
a) *significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;*  
b) *significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);*  
c) *significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);*  
d) *significant wildlife habitat; and*  
e) *significant areas of natural and scientific interest; and*  
f) *coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b)*

*unless it has been demonstrated that there will be no negative impacts on the natural features or the ecological functions.*

2.1.6 *Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*

2.1.7 *Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.*

2.1.8 *Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless*

the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions."

Under the PPS the definition of development means:

*"the creation of a new lot, a change in land use, or the construction of buildings and structures, requiring approval under the Planning Act, but does not include:*

- a. activities that create or maintain infrastructure authorized under an environmental assessment process;*
- b. works subject to the Drainage Act; or*
- c. for the purposes of policy 2.1.4(a), underground or surface mining of minerals or advanced exploration on mining lands in significant areas of mineral potential in Ecoregion 5E, where advanced exploration has the same meaning as under the Mining Act. Instead, those matters shall be subject to policy 2.1.5(a)."*

### **3.1.1. Relevance to the Development Proposal**

This development proposal shall be consistent with the Provincial Policy Statement.

## **3.2 County of Simcoe Official Plan**

The Greenland System (Section 3.8 of the County of Simcoe Official Plan) is intended "to ensure that the scale, form and location of development is such that the features and functions of the natural heritage system are sustained for future generations". This Greenland Natural Heritage System is based on a report entitled "**Development of a Natural Heritage System for the County of Simcoe**" (Gartner Lee Limited 1996, revised 2008). Within the context of the County of Simcoe Official Plan the Greenland designation includes wetlands, ANSI's, significant woodlands, significant wildlife habitat, significant valley lands, fish habitat, environmentally sensitive areas, major lake, river and creek systems and Niagara Escarpment Natural Areas. Schedule 5.1, Land Use Designations identifies those lands designated as Greenlands in the Official Plan.

### **3.2.1. Relevance to the Development Proposal**

No part of the subject lands or abutting lands is located on or within designated Greenlands in the County of Simcoe Official Plan (See Appendix A).

## **3.3 Town of Collingwood Official Plan**

The Town of Collingwood's Official Plan designates those areas which require protection because of their environmental significance (Section 4.1) as Environmental Protection Areas (Schedule A of the Official Plan) or Environmental Protection – Natural Heritage Resource Areas (Schedule B of the Official Plan). Environmental Protection Areas include lands that are not suited for development because of their natural hazards (i.e. flooding, erosion, steep slopes). The Environmental Protection – Natural Heritage Resource Areas include areas which require protection because of their environmental significance. These areas include significant wetlands, valley lands, woodland, and fish and nursery habitats. There are two categories for these areas:

- *"Category 1 lands are lands where development is prohibited. Category 1 lands are included within the Environmental Protection Areas designation on Schedule A in order to provide a heightened level of protection to Collingwood's most sensitive natural resources. Category 1 lands, by virtue of their significant functions, attributes*

and linkages, are those considered to make the greatest contribution to the natural heritage system of the Town of Collingwood and include, for example, Provincially Significant Wetlands, major river valleys, fish habitat located within significant valley-lands and primary woodlands encompassing in excess of 4 hectares (9.9 acres) that are more than 75 years old, and;

- The Category 2 classification encompasses locally significant wetlands, younger woodland encompassing an area in excess of 10 hectares (25 acres), and/or fish habitat located outside significant valley-lands. Category 2 lands are where limited forms of development, in accordance with the land use designations on Schedule A, may be possible subject to the findings of an Environmental Impact Statement (EIS)."

### **3.3.1. Relevance to the Development Proposal**

The proposed development is scheduled to occur on lands designated as Residential by the July 31, 2014 Official Plan Amendment. The remainder of the subject lands are located within lands identified by the Town of Collingwood as part of the Environmental Protection Areas or Environmental Protection – Natural Heritage Resource Areas. Schedule A of the Official Plan designates a portion of the lands as Environment Protection while Schedule B of the Official Plan illustrates that parts of the subject lands contain both Category 1 and 2 Woodlands, Category 1 Wetlands, Category 1 Valleylands and fish habitat (See Appendix B). Section 4.1.3.1 of the Town of Collingwood Official Plan notes that:

*"The uses permitted within the Environmental Protection Areas shown on Schedule A, may include conservation uses, fish and wildlife management, public/private road, public/private utility, public parks, pedestrian (walking/jogging/ bicycling/crosscountry skiing) trails, accessory parking lots or other similar passive recreational uses. Only those buildings and structures required for purposes of flood control or as accessory uses to public recreation shall be permitted. Within the Category 1 Environmental Protection – Natural Heritage Resource Areas on Schedule B the uses permitted shall be further limited and no development or site alteration, except for public works/uses required for flood or erosion control or passive public recreation (e.g. trails), or public/private road, or public/private utility shall be permitted."*

### **3.4 Nottawasaga Valley Conservation Authority Regulation**

Ontario Regulation 172/06 is the Generic Regulation of the *Conservation Authorities Act*, which came into effect in May 2006, specific to the regulation of development, interference with wetlands, and alterations to shorelines and watercourses. Under this regulation, hazardous lands, wetlands, shorelines and areas susceptible to flooding, and associated allowances within the Nottawasaga Valley Conservation Authority (NVCA) watershed limits are delineated by the "NVCA Regulated Area" shown on the NVCA's interactive online map at <https://maps.simcoe.ca/NVCA/>.

Regulation 172/06, Development, Interference with Wetlands and Alteration to Shorelines and Watercourses, requires that a permit be obtained from the NVCA when undertaking any of the following:

- Straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse or interfering in any way with a wetland;
- Development adjacent or close to the shoreline of inland lakes, in river or stream valleys, hazardous lands, wetlands or lands adjacent to wetlands.

Development as defined by the *Conservation Authorities Act* (amendment 2018) includes:

- (a) The construction, reconstruction, erection or placing of a building or structure of any kind,
- (b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure,
- (c) site grading, or
- (d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere.

The intent of the permit process is to ensure that activities in these areas will not result in a risk to public safety or property damage and that the natural features are protected through the conservation of land.

Under Ontario Regulation 172/06 Section 2, development is prohibited in or on the areas within the NVCA jurisdiction that are prone to flooding or meander hazards. The flood hazard line of the Regulation Limit is typically associated with the stable top of bank or regulatory floodplain plus a setback to facilitate access to the top of bank. Similarly, the meander belt line is depicted as the maximum extent of the predicted meander belt of the watercourse plus an allowance of 15m on each side. The Regulation Limit follows the maximum extent of the combined floodplain and meander belt limits. Under this regulation, written permission to develop within prohibited areas or alter a watercourse is required. Acquisition of this permission requires the completion of an Application for Permission to be filed with the NVCA. It should therefore be assumed that an authorization would be required for any fill or alterations within the Regulation Limit area. If the extent of the fill or alterations identified in the Development Plan were deemed significant, an Environmental Impact Study may be triggered.

#### **3.4.1. Relevance to the Development Proposal**

The subject lands are entirely located within the NVCA Regulation Area (see Figure 2) and are thus subject to Regulation 172/06.

### **3.5 Endangered Species Act**

The Provincial *Endangered Species Act* (2007) protects the endangered species that are listed on the regulations under the Act. It specifically prohibits wilful harm to endangered species that are listed in regulations under the Act and the wilful destruction of, or interference with, their habitats.

The Committee on the Status of Species at Risk in Ontario (COSSARO) assesses any Ontario species that might be experiencing declines based on research conducted by government staff or reports from other sources. Species are classified into categories based on the degree of risk that they face which include Extirpated, Endangered, Threatened or Special Concern. Only those species that are categorized as either Extirpated, Endangered or Threatened are afforded protection under the *Endangered Species Act*. A searchable online database of the species assessment reports is available at [www.cossaroagency.ca/species](http://www.cossaroagency.ca/species).

#### **3.5.1. Relevance to the Development Proposal**

A search of the species assessments reports in conjunction with the species lists generated during the field inventories revealed that two bird species, Eastern Meadowlark and Bobolink are classified as Threatened. A third bird species, Eastern Wood-pewee was detected and classified as Special Concern. One amphibian species observed on the subject lands, Western Chorus Frog, is also classified as Threatened. Detailed results from the acoustic bat

monitoring surveys were not available at the time of the completion of this report however the data collected has confirmed the probable presence of SAR bats primarily located within the PSW and associated forested area.

### **3.6 Species at Risk Act**

The Federal *Species at Risk Act* (2002) is designed to prevent wildlife species from becoming extinct or extirpated; help in the recovery of extirpated, endangered or threatened species; and to ensure that species of special concern do not become endangered or threatened.

The Act maintains an on-line registry of species at risk which is the official Federal list of wildlife species at risk. Species are classified as being either Extirpated, Endangered, Threatened, or Special Concern. Once the species becomes listed, the measures to protect and recover a listed wildlife species are implemented. Only those species that are categorized as Extirpated, Endangered or Threatened are afforded protection under the *Species At Risk Act*. The on-line registry is available at [www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html](http://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html).

#### **3.6.1. Relevance to the Development Proposal**

A search of the species assessments reports in conjunction with the species lists generated during the field inventories revealed that two bird species, Eastern Meadowlark and Bobolink are classified as Threatened. A third bird species, Eastern Wood-pewee was detected and classified as Special Concern. One amphibian species observed on the subject lands, Western Chorus Frog, is also classified as Threatened. Detailed results from the acoustic bat monitoring surveys were not available at the time of the completion of this report however the data collected has confirmed the probable presence of SAR bats primarily located within the PSW and associated forested area.

## **4.0 Study Area**

### **4.1 Field Investigations**

Field investigations for the subject lands were completed in the spring and summer field season of 2019 to collect updated data to supplement the field investigations which were completed in 2010. All field investigations were completed by qualified biologists, in-season and during the appropriate timing windows and per Provincial protocols. The field investigations included Breeding Amphibians, Breeding Birds, Bats, Turtles and Ecological Land Classification. A review of Species At Risk (SAR) habitat presence/absence was also completed as well as observations of incidental wildlife.

#### **4.1.1. Collection and Review of Background Information**

Prior to and during the natural heritage field inventories, background natural environment information was solicited through various means from the Ministry of Environment, Conservation and Parks (MECP) NVCA, the Natural Heritage Information Centre, the Town of Collingwood and the County of Simcoe.

A coloured aerial photo that provided coverage of the property and adjacent lands was obtained. The aerial photo was used initially as a base to map the boundaries and types of vegetation cover on-site. Types of vegetation cover included natural and cultural terrestrial vegetation communities (e.g., upland deciduous, mixed and coniferous forest, lowland deciduous forest, old field meadow, agricultural pastureland), wetland vegetation communities (e.g., deciduous treed swamp, mixed treed swamp, shrub thicket swamp, rush



meadow marsh), and vegetation communities associated with floodplain and edges of Silver Creek. As well, surrounding land uses were noted, including the extent and connectivity.

#### 4.1.2. Field Reconnaissance and Inventories

Site reconnaissance and inventories to document the vegetation communities and floristics on the subject property were undertaken on June 3, 4, June 23, August 4, 5, and September 8, 17, 18, and 22, 2010. As time has passed since the last submission in 2011, follow-up site reconnaissance and inventories were conducted on May 24, June 28 and July 26, 2019. The main purpose of the 2019 site inventories was to confirm and document any changes in the vegetation community types, that may have changed or been altered due to factors such as flooding, natural succession, forest management (e.g., logging) and/or agricultural land uses (e.g., cattle grazing).

The existing natural and cultural terrestrial and wetland features on-site were ascertained through a combination of aerial photograph interpretation and ground-truthing. The boundaries of each vegetation community were mapped, qualitatively characterized and photographed. Documentation consists of qualitative descriptions of the major dominant species and by application of the Ecological Land Classification (ELC) system characterization of the vegetation communities following the protocol by Lee *et al.* (1998) using updated ELC vegetation types (Lee 2008), where applicable. Typical constituent flora in the canopy, understory, shrub and groundcover strata for each vegetation community was recorded, where applicable. As well, representative photographs of the on-site vegetation communities and other relevant natural and cultural features and points of interest were compiled to provide a visual context. Brief notes were recorded on other attributes such as topography, drainage patterns, soils, soil moisture and disturbance factors. A list of vascular plant species were recorded for each terrestrial and wetland vegetation community and compiled into a master plant species list for the entire subject property.

In addition to delineating and documenting the vegetation communities, the outer boundaries of the on-site wetland features were flagged in 2010. Their boundaries were confirmed by MNRF staff (Graham Findlay) on August 5 and September 22, 2010 and subsequently surveyed and plotted onto the site plan. The main wetland features (confirmed on August 5, 2010) included parts of the Silver Creek Wetland Complex PSW, which borders the northern portion of the property. In addition, several internal wetland features ("other wetland") which are associated with ridge and trough formations were also flagged, confirmed (September 22, 2010) and subsequently surveyed and plotted onto the site plan.

#### 4.1.3. Vegetation Resources

The classification of the general vegetation communities were characterized according to species composition and physiognomic characteristics. The nomenclature for the flora observed is consistent with and relied on the following authorities:

- Lycopodiaceae to Aspleniaceae Cody, W. J., and D. F. Britton. 1989. **Fern and Fern Allies of Canada**. Publication 1829/E, Agriculture Canada, Research Branch, Ottawa.
- Taxaceae to Orchidaceae – Voss, E. G. 1972. **Michigan Flora. Part 1: Gymnosperms and Monocots**. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 55.
- Saururaceae to Cornaceae – Voss, E. G. 1985. **Michigan Flora. Part 2: Dicots**. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 59.
- Pyrolaceae to Compositae – Voss, E. G. 1996. **Michigan Flora. Part 3: Dicots**. Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 61.
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The rarity or significance for vegetation communities and vascular plants (floristics) on the property was determined from standard status lists, published literature and the NHIC dataquery web-site (NHIC 2019). Sources for flora included Bakowsky (1997), Environment and Climate Change Canada (2019), COSEWIC (2019), Province of Ontario (2007), NHIC (2019), MNRF (2019), Oldham and Brinker (2009), and Riley (1989). Rare plant species (Species At Risk in Ontario – SARO) included those listed and regulated under the Province of Ontario **Endangered Species Act**. The determination for plant species rarity consisted of a straightforward comparison of the property's plant species with those listed in these source references.

Based on Chapman and Putnam (1984), the lowlands that border Georgian Bay and Lake Simcoe are referred to as the Simcoe Lowlands.

The subject property lies within the Huron-Ontario Section of the Great Lakes-St. Lawrence Forest Region, based on the forest classification system by Rowe (1972). The region extends north of the Niagara Section, along Lake Huron, and from the southern portion of Georgian Bay to Lake Ontario. The forest cover is typically dominated by sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*), which are common throughout the entire area. Other common woody associates include white ash (*Fraxinus americana*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), basswood (*Tilia americana*), eastern white cedar (*Tsuga occidentalis*), red ash (*Fraxinus pennsylvanica*), yellow birch (*Betula alleghaniensis*), white birch (*Betula papyrifera*), and bur oak (*Quercus macrocarpa*). Present though not as widespread are eastern hemlock (*Tsuga canadensis*), eastern white pine (*Pinus strobus*), balsam fir (*Abies balsamea*), large-toothed aspen (*Populus grandidentata*), trembling aspen (*Populus tremuloides*), hop hornbeam (*Ostrya virginiana*), black cherry (*Prunus serotina*) and bitternut hickory (*Carya cordiformis*). River-bottom, swamps and low-lying terrain have varying distributions and compositions dominated by eastern white cedar, silver maple (*Acer saccharinum*), white elm (*Ulmus americana*), black ash (*Fraxinus nigra*) and green ash (*Fraxinus pennsylvanica* var. *subintegerrima*).

As stated in Rowe (1972), the original forest cover in many parts of southern and central Ontario has been cleared for settlement and cultivation, and consequently, contiguous, extensive forest tracts are relatively uncommon. Tableland woodland cover remaining within settlement (urban, semi-rural and lake shoreline) areas is usually disturbed to some degree and/or in various stages of successional re-growth.

## 4.2 Physiography, Topography and Drainage

According to the Soil Survey of Simcoe County (1990), the soil on the subject property includes five series; Wiarton, Parkhill, Tioga, Alliston and Granby. A general description of the soil series is provided in Table 1 below. Bedrock and surficial geology are illustrated on Figures 3 and 4.

**Table 1. Soil Series found on the Subject Lands**

| <b>Soil Series</b>       | Warton                                           | Parkhill                                         | Tioga                                        | Alliston                      | Granby                        |
|--------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------|-------------------------------|-------------------------------|
| <b>Soil Materials</b>    | Pale yellow, calcareous, loam and silt loam till | Pale yellow, calcareous, loam and silt loam till | Grey, calcerous outwash sand                 | Grey, calcerous outwash sand  | Grey, calcerous outwash sand  |
| <b>Drainage</b>          | Imperfect                                        | Poor                                             | Good                                         | Imperfect                     | Poor                          |
| <b>Topography</b>        | Smooth, gently sloping                           | Smooth, very gently sloping                      | Smooth, gently to irregular, steeply sloping | Smooth, very gently sloping   | Level                         |
| <b>Surface Stoniness</b> | Slightly to very stony                           | Slightly stony                                   | Stonefree to moderately stony                | Stonefree to moderately stony | Stonefree to moderately stony |
| <b>Surface Reaction</b>  | Neutral to Alkaline                              | Alkaline                                         | Medium acid                                  | Medium acid                   | Medium acid                   |
| <b>Great Soil Group</b>  | Grey-Brown Podzolic                              | Dark Grey Gleisolic                              | Podzol                                       | Podzol                        | Podzol                        |

#### 4.2.1. Hydrology and Hydrogeology

The varied existing drainage conditions across the subject lands have been characterized in reports prepared under separate cover by C.F. Crozier and Associates Inc. See Functional Servicing and Stormwater Management Report and Natural Hazards Study, both studies by C.F. Crozier and Associates Inc. (January 2011, updated July 2019)

### 4.3 Vegetation

#### 4.3.1. Regional Vegetation Cover

A forest region classification system developed by Rowe (1972), categorizes the vegetation of Canada into eight major forest regions, or vegetation formations. These vegetation formations are based primarily on the presence and distribution of dominant tree species within each and are considered to reflect direct responses to broad climatic regimes. Within each of the major regions, a number of distinct sections were delineated according to local patterns in tree composition resulting from variations in physiographic and geological features. Based on this classification system, the Huntingwood Trails property is situated within the Huron-Ontario Section of the Great Lakes-St. Lawrence Forest Region.

This region essentially covers the same geographical limits as the Lake Simcoe-Rideau Site Region 6E of Ontario as outlined in the classification system by Hills (1959). Each site region is further subdivided according to characteristic physiographic zones, which Hills referred to as Site Districts. The subject lands lie within Site District 6-6, which is described as an area of water-laid clay, silt and sand broken by ridges of loam and sandy loam. The western portion of the Lake Simcoe basin contains the Nottawasaga basin, drained by the Nottawasaga River. Shorecliffs, beaches, dunes and boulder terraces border these low-lying lake plains. Based on the afore-mentioned technical documents, the subject lands lie within the more refined Ministry of Natural Resources (MNR) Site District 6-6 (Burger 1993).

Characteristic forest cover consists of a relatively rich mixture of hardwood and coniferous tree species, in various combinations and densities. Natural woodlands on well-drained sites are typically dominated by sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*). Other woody associates include basswood (*Tilia americana*), white ash (*Fraxinus americana*), red ash (*Fraxinus pennsylvanica*), yellow birch (*Betula alleghaniensis*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), white oak (*Quercus alba*) and bur oak (*Quercus*

*macrocarpa*). Conifers found within the tolerant hardwood types include eastern hemlock (*Tsuga canadensis*), eastern white pine (*Pinus strobus*) and balsam fir (*Abies balsamea*). Large-toothed aspen (*Populus grandidentata*), black cherry (*Prunus serotina*), butternut (*Juglans cinerea*) and ironwood (*Ostrya virginiana*) also occur frequently on upland sites, but are rarely abundant.

Blue-beech (*Carpinus caroliniana*), silver maple (*Acer saccharinum*), slippery elm (*Ulmus rubra*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica* var. *subintegerrima*), white elm (*Ulmus americana*) and eastern white cedar (*Thuja occidentalis*) are also relatively common, but generally occur on slightly moister, cooler sites, notably in deep river valley systems, swamp sites or wetland margins.

Trembling aspen (*Populus tremuloides*), large-toothed aspen, balsam poplar (*Populus balsamifera*) and cottonwood (*Populus deltoides*) are also widespread, usually occurring within young, successional forests, and usually at the ecotones (interface) between fields and more mature phases of forest growth.

As with many parts of southern and central Ontario, much of the original forest cover has been cleared for cultivation and settlement; consequently, contiguous, extensive forest tracts are relatively uncommon (Rowe 1972). However, in areas having limited agricultural capability or erosion susceptible soils, many abandoned farmlands have been planted with extensive conifer plantations or are reverting to natural plant cover and in varying stages of successional development (e.g. wet meadow, old fields, thickets, young pioneer (poplar-birch) stands, etc.).

#### 4.3.2. Terrestrial Units

Overall, the subject lands are essentially bisected by a reach of Silver Creek, with tableland on the west side of the creek cleared in the past for agricultural uses (crops and pastureland), characterized as open graminoid meadow (MEFM4) and poplar-green ash woodland (WODM5-1). The floodplain of the creek contains willow lowland woods (FODM7-3), reed canary grass meadow marsh (MAMM1-3) and lowland green ash woods (FODM7-2). The eastern portion is covered for the most part by a series of east-west oriented "ridges and troughs". The sandy and sandy-loam ridges are essentially forested with a combination of: upland poplar-birch woods (FODM3-1); upland cedar-hardwood mixed woods (FOMM4-3); upland cedar woods (FOCM2-2); and lowland green ash woods (FODM7-2). The clayey troughs are vegetated with various wetland types such as: red maple-green ash treed swamp (SWDM3-1); poplar-cedar treed swamp (SWMM3-2); green ash treed swamp (SWDM2-2); poplar treed swamp (SWDM4-5); dogwood thicket swamp (SWTM2-1); and rush meadow marsh (MAMM1-13). There are also blocks and openings of goldenrod forb meadow (MEFM1-1) within the upland woods. Most of the wetland features lie within a portion of the Silver Creek Wetland Complex, a provincially significant wetland (PSW).

Figure 5 shows the types and extent of the natural and cultural terrestrial features, as well as the wetland aquatic features on the property. Where applicable, these features are characterized following the terminology of the Ecological Land Classification (ELC) system developed by the MNR, an **Ecological Land Classification for Southern Ontario – First Approximation and Its Application** (Lee *et al.* 1998), with updated revisions to the ELC vegetation types contained in Lee (2008). In addition to the ELC system, additional characterization of the on-site vegetation communities was aided through a review of the **Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario** (Bakowsky 1997).

As defined in Lee *et al.* (1998), an Ecosite, "is a mappable landscape unit defined by a

relatively uniform parent material, soil and hydrology, and consequently supports a consistently recurring formation of plant species which develop over time (vegetation chronosequence)." Within each ecosite landscape unit, there are a variety of vegetation types. A vegetation type, "is a part of an ecosite, and represents a specific assemblage of species which generally occur in a site with a more uniform parent material, soils and hydrology, and a more specific stage within a chronosequence."

Table 2 provides a summary and brief description of the ELC units (vegetation types) delineated and characterized on-site. The following sub-sections provide summary descriptions of the natural and cultural terrestrial features and wetland features, including their ELC characterization, approximate boundaries and inherent species composition in the overstorey, understorey, shrub and groundcover strata, where applicable. Figure 5 in conjunction with Table 2 and the representative photographs provide a descriptive summary and visual context of the natural, cultural and aquatic features that exist on the property.

#### **Dry-Fresh Poplar Deciduous Forest Type (FODM3-1)**

Some of the sandy and sandy-loam ridges on the east portion of the property are dominated by early successional poplar (trembling aspen) woods, in combination white birch, with all units lying to the east of Silver Creek. Other woody associates in the semi-open to closed canopy and understory include white ash, basswood, red oak and scattered sugar maple. The dense shrub stratum contains bush honeysuckle (*Diervilla lonicera*), alternate-leaved dogwood (*Cornus alternifolia*), wild grape (*Vitis riparia*), black raspberry (*Rubus occidentalis*), round-leaf dogwood (*Cornus rugosa*), wild red raspberry (*Rubus idaeus*) and poison ivy (*Rhus radicans*). Two of these units lie along the southern edge and northern edge of wetland units B and C respectively (See Appendix D, Photographs 1 and 2). A relatively large block lies in the southeast corner on the east side of Silver Creek and was clear-cut after 2012 as shown on the July 26 2019 photograph (See Appendix D, Photograph 3). Forested units FODM4-3 (south side) and FODM2-2 (north side) are contiguous with this cut-over poplar bush. It would appear that the northern edge of FODM4-3 and the southern edge of FODM2-2 have also been clear-cut, the extent to which has not been quantified. The cut-over portions are now naturally regenerating with seedlings, saplings and pole-sized trembling aspen.

The groundcover stratum is not dominated by white sweet clover (*Melilotus alba*), along with the typical groundcover species noted in 2010, which includes eastern bracken fern (*Pteridium aquilinum*), wild lily-of-the-valley (*Maianthemum canadense*), common buttercup (*Ranunculus acris*), wild basil (*Clinopodium vulgare*), field horsetail (*Equisetum arvense*), wild sarsaparilla (*Aralia nudicaulis*), wood betony (*Pedicularis canadensis*), white snakeroot (*Eupatorium rugosum*), spreading dogbane (*Apocynum androsaemifolium*), enchanters nightshade (*Circaea lutetiana*), herb-robert (*Geranium robertianum*), common milkweed (*Asclepias syriaca*) and rough-leaved rice grass (*Oryzopsis asperifolia*).

#### **Fresh-Moist Green Ash-Hardwood Lowland Deciduous Forest Type (FODM7-2)**

Two relatively large blocks of lowland green ash-hardwood bush lie in the eastern portion of the property (See Appendix D, Photographs 4 and 5). Other woody associates include white elm, common buckthorn (*Rhamnus cathartica*), alternate-leaved dogwood, Virginia creeper (*Parthenocissus inserta*), hawthorn (*Crataegus* spp.) and white ash. The groundcover in the northern block contains a high percentage of weeds and forbs, as a result of past cattle grazing within this feature. Characteristic species include common dandelion (*Taraxacum officinale*), poison ivy, yellow avens (*Geum aleppicum*), tall goldenrod (*Solidago altissima*), enchanters nightshade, wild basil, woodland strawberry (*Fragaria vesca*), herb-robert, common buttercup, fringe loosestrife (*Lysimachia ciliata*) and graceful sedge (*Carex gracillima*).

### **Fresh-Moist Willow Lowland Deciduous Forest Type (FODM7-3)**

Bordering the edges of Silver Creek and within its floodplain, is an open lowland wooded stand dominated by crack willow (*Salix fragilis*) and hybrid willow (*Salix x rubens*). Other woody associates include white elm, green ash, white willow (*Salix alba*), Manitoba maple (*Acer negundo*), scattered common juniper (*Juniperus communis*) and wild red raspberry (See Appendix D, Photographs 6 and 7).

The lush groundcover is dominated by ostrich fern (*Matteuccia struthiopteris*), reed canary grass (*Phalaris arundinacea*), Canada bluejoint grass (*Calamagrostis canadensis*), Canada thistle (*Cirsium arvense*), spotted Joe pye-weed (*Eupatorium maculatum*), beggar-ticks (*Bidens frondosus*), spotted jewelweed (*Impatiens capensis*), hog peanut (*Amphicarpa bracteata*), stinging nettle (*Urtica dioica*), meadow sedge (*Carex granularis*), awl-fruited sedge (*Carex stipata*), common buttercup, common burdock (*Arctium minus*), wild carrot (*Daucus carota*), common blue-eyed grass (*Sisyrinchium montanum*) and hound's-tongue (*Cynoglossum officinale*).

### **Naturalized Deciduous Hedge-row Ecosite (FODM11)**

Bordering the south property perimeter on the west side of Silver Creek is a deciduous hedgerow dominated by green ash and white elm (See Appendix D, Photograph 8). The ground cover consists of weeds and grasses.

### **Dry-Fresh White Cedar Coniferous Forest Type (FOCM2-2)**

There are two bands of upland white cedar woods, situated on the east side of Silver Creek, that border onto treed swamp wetland features in adjacent troughs (See Appendix D, Photographs 9 and 10). A dense distribution of eastern white cedar dominates the closed canopy and understorey. There are scattered hardwood and softwood associates such as trembling aspen, white birch and sugar maple. The lack of light penetration is reflected in a barren to sparse groundcover. Common groundflora includes helleborine (*Epipactis helleborine*), common dandelion, eastern bracken fern, spinulose wood-fern (*Dryopteris spinulosa*), bulblet fern (*Cystopteris bulbifera*), poison ivy, common strawberry, yellow avens and white ash seedlings. As per site visits conducted in 2019, it would appear the southern edge of this upland woodland feature has been clear-cut, with the amount removed not quantified to-date.

### **Dry-Fresh White Cedar-Hardwood Mixed Forest Type (FOMM4-3)**

Dominant trees in the canopy and understory include eastern white cedar, trembling aspen, white birch, balsam poplar, and white elm. Other woody associates include green ash, yellow birch, white ash, common buckthorn, Canada buffaloberry (*Shepherdia canadensis*) and scattered sugar maple, red oak and black cherry (See Appendix D, Photographs 11 and 12). As per site visits conducted in 2019, it would appear the northern edge of this upland woodland feature has been clear-cut, with the amount removed not quantified to-date.

The groundflora contains weeds, grasses, ferns and woodland wildflowers typical for upland mixed forest, dominated by cedar and hardwoods. Characteristic species include heart-leaved aster (*Symphyotrichum cordifolium*), large-leaved aster (*Eurybia macrophylla*), yellow ladies-slipper (*Cypripedium pubescens* var. *pubescens*), graceful sedge, ground-pine (*Lycopodium dendroideum*), creeping buttercup (*Ranunculus repens*), eastern woodland sedge (*Carex blanda*), wild lily-of-the-valley, Jack-in-the-pulpit (*Arisaema triphyllum*), enchanter's nightshade, wild basil, eastern bracken fern, spinulose wood-fern and field horsetail.

### **Fresh-Moist Poplar Deciduous Woodland Type (WODM5-1)**

Stands of this lowland woodland type are found on both sides of Silver Creek, and are

dominated with a combination of trembling aspen, balsam poplar, green ash, crack willow and white ash (See Appendix D, Photographs 13 and 14). The open to semi-open canopies, understory and shrub stratum also contain bush honeysuckle, common buckthorn, wild red raspberry, wild grape, poison ivy and Virginia creeper. As shown on Photograph 13, parts of the stand on the west side of Silver Creek, adjacent to Forest Drive have been selectively cut in the past. The majority of this unit has not grazed by cattle in 2019.

Past and present cattle grazing has resulted in a rather weedy/grass groundcover, dominated by fringed loosestrife, yellow avens, tall goldenrod, Canada goldenrod, herb-robert, enchanters nightshade, woodland strawberry, common dandelion, common buttercup, graceful sedge, orchard grass (*Dactylis glomerata*) and poison ivy, among many other weedy/grassed groundcover species and species with wetland affinities.

### **Goldenrod Forb Meadow Type (MEFM1-1)**

This vegetation type or cultural feature is characterized by broad-leaved forbs, along with common meadow grasses, ferns and sedges (See Appendix D, Photographs 15, 16 and 17). The large blocks in the northeast and south central portions of the property are being encroached upon by naturally regenerating trembling aspen, eastern white cedar and common crab-apple (*Malus pumila*).

The weedy/grass groundcover contains species such as:

|                                     |                             |
|-------------------------------------|-----------------------------|
| <i>Daucus carota</i>                | wild carrot                 |
| <i>Trifolium pratense</i>           | red clover                  |
| <i>Ranunculus acris</i>             | common buttercup            |
| <i>Tragopogon dubius</i>            | goat's-beard                |
| <i>Prunella vulgaris</i>            | heal-all                    |
| <i>Verbascum thapsus</i>            | common mullein              |
| <i>Agrimony gryposepala</i>         | hairy agrimony              |
| <i>Symphyotrichum novae-angliae</i> | New England aster           |
| <i>Solidago canadensis</i>          | Canada goldenrod            |
| <i>Solidago altissima</i>           | tall goldenrod              |
| <i>Monarda fistulosa</i>            | wild bergamot               |
| <i>Trifolium repens</i>             | white clover                |
| <i>Sonchus arvensis</i>             | sow-thistle                 |
| <i>Cirsium arvense</i>              | Canada thistle              |
| <i>Cirsium vulgare</i>              | bull thistle                |
| <i>Maianthemum stellatum</i>        | starry false Solomon's-seal |
| <i>Asclepias syriaca</i>            | common milkweed             |
| <i>Fragaria virginiana</i>          | common strawberry           |
| <i>Plantago major</i>               | common plantain             |
| <i>Plantago lanceolata</i>          | English plantain            |
| <i>Hypericum perforatum</i>         | common St. John's-wort      |
| <i>Chrysanthemum leucanthemum</i>   | ox-eye daisy                |
| <i>Rhus radicans</i>                | poison ivy                  |
| <i>Desmodium glutinosum</i>         | showy tick-trefoil          |
| <i>Vicia cracca</i>                 | cow vetch                   |
| <i>Dactylis glomerata</i>           | orchard grass               |
| <i>Festuca pratensis</i>            | meadow fescue               |
| <i>Phleum pratense</i>              | timothy                     |
| <i>Bromus inermis</i>               | awnless brome grass         |
| <i>Phalaris arundinacea</i>         | reed canary grass           |
| <i>Poa compressa</i>                | Canada blue grass           |
| <i>Poa pratensis</i>                | Kentucky blue grass         |
| <i>Pteridium aquilinum</i>          | eastern bracken fern        |

#### **Open Graminoid Meadow Type (MEFM4)**

This cultural feature is similar in structure to MEFM1-1, but lacks an abundance of broad-leaved forbs, and is dominated by grasses, with an obvious historical agricultural land use, such as cropland or pastureland. The relatively large block on the west side of Silver Creek is currently grazed by cattle in 2019 (See Appendix D, Photographs 18 and 19). Typical grasses in this feature include various combinations of orchard grass, timothy, awnless brome grass, reed canary grass, Kentucky blue grass and meadow fescue. Broad-leaved forbs include goldenrods, asters, wild carrot, common milkweed, common buttercup and thistles. Most of the west half of the property (west of Silver Creek) is comprised of this meadow type.

#### **Green Ash Mineral Deciduous Swamp Type (SWDM2-2)**

A large block of this wetland type lies along the northern edge of the property and is contained within a portion of the Silver Creek Wetland Complex, a provincially significant wetland (PSW) (See Appendix D, Photographs 20 and 21). The boundary of this wetland feature was staked and confirmed on August 5, 2010 by MNR staff (See Figure 6). The closed canopy and understory are dominated by relatively even-aged green ash, along with white elm. Other woody associates include crack willow, hybrid willow, trembling aspen, balsam poplar, alternate-leaved dogwood and red-osier dogwood (*Cornus stolonifera*).

Parts of the stand are inundated during the growing season with standing water, so the groundcover is non-existent or sparse. The wet outer edges contain a lush growth of sedges, grasses, ferns and aquatic forbs. Characteristic species include yellow rocket (*Barbarea vulgaris*), awl-fruited sedge (*Carex stipata*), moneywort (*Lysimachia nummularia*), drooping woodland sedge (*Carex arctata*), reed canary grass, marsh fern (*Thelypteris palustris*), fringed loosestrife, tall meadowrue (*Thalictrum pubescens*), sensitive fern (*Onoclea sensibilis*), ostrich fern, Jack-in-the-pulpit, blue flag (*Iris versicolor*), spotted jewelweed and wild mint.

#### **Red Maple Mineral Deciduous Swamp Type (SWDM3-1)**

Red maple and green ash dominate this treed swamp wetland feature, with three separate units that lie within the low-lying troughs, between the upland sandy ridges on the east side of Silver Creek. The orientation of these ridge-trough formations is east-west (See Appendix D, Photographs 22, 23, 24 and 25). Other woody associates include black ash (*Fraxinus nigra*), swamp maple (*Acer freemanii*), yellow birch, trembling aspen, white elm, balsam poplar, alternate-leaved dogwood, red-osier dogwood, bush honeysuckle and scattered eastern white cedar. Major portions of each unit were inundated with standing water well into the growing season. Other portions (slightly raised sections) and the outer perimeters contain wet to saturated imperfectly drained muck/clay soils that provide a growing medium for sedges, grasses, ferns and aquatic forbs, typical for this region. The boundaries of these three wetland features were staked and confirmed on September 22, 2010 by MNR staff (See Figure 6).

Typical groundflora includes marsh fern, sensitive fern, ostrich fern, water horsetail (*Equisetum palustre*), fringed loosestrife, crested fern (*Dryopteris cristata*), interior sedge (*Carex interior*), bladder sedge (*Carex intumescens*), awl-fruited sedge, graceful sedge, Virginia creeper, cleavers (*Galium aparine*), clearweed (*Pilea pumila*), beggar-ticks (*Bidens frondosus*), Jack-in-the-pulpit, water parsnip (*Sium sauve*), soft-stem bulrush (*Scirpus validus*), wool-grass, (*Scirpus cyperinus*), dark green bulrush (*Scirpus atrovirens*), spotted jewelweed, tall meadowrue, swamp milkweed (*Asclepias incarnata*), fragrant bedstraw (*Galium triflorum*), reed canary grass, nodding sedge (*Carex gynandra*), water horehound (*Lycopus americanus*) and blue flag.

#### **Poplar Mineral Deciduous Swamp Type (SWDM4-5)**

This wetland feature lies in the northwest corner of the property and is part of the Silver Creek Wetland Complex (See Appendix D, Photographs 26 and 27). Its boundary on-site was



staked and confirmed by MNR staff on August 5, 2010. Trembling aspen, balsam poplar, black ash, white birch, red-osier dogwood, alternate-leaved dogwood, meadowsweet (*Spiraea alba*), green ash and white elm are the dominant woody vegetation species.

Species observed in the lush groundcover include awl-fruited sedge, interior sedge, marsh fern, sensitive fern, ostrich fern, fragrant bedstraw, fringed loosestrife, spotted jewelweed, spotted Joe pye-weed, deadly nightshade, water horehound, rice cut grass (*Leeria oryzoides*) and wild mint.

#### **Poplar-Conifer Mineral Mixed Swamp Type (SWMM3-2)**

Three units of this treed swamp feature lie in narrow troughs in the southeast corner of the property (See Appendix D, Photographs 28 and 29). These stands are dominated by trembling aspen, large-toothed aspen and eastern white cedar. Alternate-leaved dogwood, red-osier dogwood, white elm and green ash are typical woody associates. Only small portions of these wetland features contained standing water during the early growing season. The wet-saturated soils contain fringed loosestrife, wild mint, sensitive fern, blue flag, Jack-in-the-pulpit, mosses, wild grape, narrow-leaved cattail (*Typha angustifolia*), meadow horsetail (*Equisetum pratense*), awl-fruited sedge, interior sedge, bladder sedge and dwarf strawberry (*Rubus pubescens*). The boundaries of these three wetland features were staked and confirmed on September 22, 2010 by MNR staff (See Figure 6).

#### **Red-osier Dogwood Mineral Deciduous Thicket Swamp Type (SWTM2-1)**

Two small pockets of this shrub thicket swamp type lie within the trough formations, with one considered an inclusion (contains standing stagnant water through growing season) within one of the red maple-green ash treed swamp features (SWDM3-1) (See Appendix D, Photograph 30). Red-osier dogwood and alternate-leaved dogwood are the dominant shrubs species, along with scattered willow shrubs (*Salix discolor*). The stagnant standing water within the feature inclusion contains common duckweed (*Lemna minor*), along with swamp milkweed, ostrich fern, sensitive fern, water horehound and bladder sedge. The boundaries of these two wetland features were staked and confirmed on September 22, 2010 by MNR staff (See Figure 6).

#### **Reed-canary Grass Graminoid Mineral Meadow Marsh Type (MAMM1-3)**

A narrow band of this meadow marsh feature lies within the floodplain and along the edges of Silver Creek (See Appendix D, Photograph 31). Other grasses and sedges in this feature include ostrich fern, Canada bluejoint grass, spotted Joe pye-weed, virgin's-bower (*Clematis virginiana*), Canada anemone (*Anemone canadensis*), coltsfoot (*Tussilago farfara*), elecampane (*Inula helenium*), beggar-ticks, spotted jewelweed, wild mint, meadow sedge, blue flag and wood nettle (*Laportea canadensis*).

#### **Rush Graminoid Mineral Meadow Marsh Type (MAMM1-13)**

This wetland feature lies in the northeast corner of the property and is dominated by rushes and sedges (See Appendix D, Photograph 32). Jointed rush (*Juncus articulatus*) is the dominant rush, with other sedge associates such as awl-fruited sedge, interior sedge and meadow sedge. Other wetland and meadow plants include fragrant bedstraw, blue-eyed grass, deadly nightshade, dark green bulrush, fringed loosestrife, water horsetail, meadow horsetail, riverbank grape, Canada bluejoint grass, nodding sedge and reed canary grass. The boundary of this wetland feature was staked and confirmed on August 5, 2010 by MNR staff (See Figure 6).

**Table 2. List of Vegetation Communities (ELC Units) on the Huntingwood Trails Property**

| ELC Code | Vegetation Type                                              | Summary Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FODM3-1  | dry-fresh poplar deciduous forest type                       | <ul style="list-style-type: none"> <li>- upland sandy ridges between wetland units dominated by trembling aspen, largetooth aspen and white birch</li> <li>- other woody associates in canopy and understory white ash, basswood, red oak and scattered sugar maple</li> <li>- shrub stratum contains northern bush honeysuckle, alternate-leaved dogwood, wild grape, black raspberry, spreading dogbane, red raspberry and poison ivy</li> <li>- characteristic groundflora includes eastern bracken fern, wild lily-of-the-valley, common buttercup, common milkweed, wild basil, field horsetail and rough-leaved rice grass</li> </ul> |
| FODM7-2  | fresh-moist green ash-hardwood lowland deciduous forest type | <ul style="list-style-type: none"> <li>- blocks of lowland woods dominated by green ash and white elm</li> <li>- other woody species include common buckthorn, alternate-leaved dogwood and Virginia creeper</li> <li>- groundcover consists mainly of weeds and forbs such as enchanters nightshade, herb-robert, woodland strawberry, common dandelion, common buttercup and yellow avens</li> <li>- woodlot shows signs of past grazing activity (cattle), as evidenced by weedy groundcover and lack of woody regeneration</li> </ul>                                                                                                   |
| FODM7-3  | fresh-moist willow lowland deciduous forest type             | <ul style="list-style-type: none"> <li>- situated in floodplain along both sides of Silver Creek</li> <li>- dominant species include crack willow, hybrid willow, green ash, white elm and Manitoba maple</li> <li>- shrub species include wild red raspberry, red-osier dogwood, alternate-leaved dogwood and willow shrubs</li> <li>- typical groundcover comprised of ostrich fern, reed canary grass, Canada bluejoint grass, elecampane, wild mint, hog peanut, stinging nettle, common buttercup, common burdock and wild carrot</li> </ul>                                                                                           |

|         |                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FODM11  | naturalized deciduous hedge-row ecosite          | <ul style="list-style-type: none"> <li>- linear hedge-row situated along southern edge of property on west side of Silver Creek</li> <li>- characteristic trees and shrubs include green ash, white elm, red-osier dogwood and trembling aspen</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                            |
| FOCM2-2 | dry-fresh white cedar coniferous forest type     | <ul style="list-style-type: none"> <li>- small pockets on upland wooded ridges between wetland units</li> <li>- closed canopy dominated by eastern white cedar, with scattered trembling aspen and white birch</li> <li>- characteristic groundcover included bulblet fern, spinulose wood-fern, common strawberry, common buttercup, helleborine and poison ivy</li> </ul>                                                                                                                                                                                                                                                                                          |
| FOMM4-3 | dry-fresh white cedar-hardwood mixed forest type | <ul style="list-style-type: none"> <li>- relatively large blocks of upland woodland dominated by eastern white cedar, along with trembling aspen, white birch, balsam poplar, white elm and white ash</li> <li>- other woody associates include common buckthorn, black cherry, green ash, yellow birch and dogwoods</li> <li>- typical groundflora includes heart-leaved aster, yellow lady-slipper, poison ivy, yellow avens, eastern bracken fern, wild lily-of-the-valley, helleborine, herb-robert, enchanters nightshade and wild basil</li> </ul>                                                                                                             |
| WODM5-1 | fresh-moist poplar deciduous woodland type       | <ul style="list-style-type: none"> <li>- open to semi-open canopy contains green ash, trembling aspen, white elm, balsam poplar, crack willow and white ash</li> <li>- groundcover dominated by weeds and common grasses</li> <li>- exhibits affects (abundance of non-native groundcover) from past cattle grazing</li> </ul>                                                                                                                                                                                                                                                                                                                                       |
| MEFM1-1 | goldenrod forb meadow type                       | <ul style="list-style-type: none"> <li>- blocks of old field habitat dominated by broad-leaved forbs, along with grasses</li> <li>- some encroachment by poplars and cedars from adjacent woodland edges</li> <li>- characteristic groundflora includes showy tick-trefoil, wild carrot, red clover, white clover, tall goldenrod, Canada goldenrod, goat's-beard, New England aster, heal-all, hairy agrimony, timothy, orchard grass, awnless brome grass, wild bergamot, Canada anemone, yellow hawkweed, common buttercup, starry false Solomon's-seal, spreading dogbane, ox-eye daisy, English plantain, eastern bracken fern and common strawberry</li> </ul> |

|         |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MEFM4   | open graminoid meadow type             | <ul style="list-style-type: none"> <li>- blocks of grassland, dominated by timothy, meadow fescue, orchard grass, reed canary grass, goldenrods, asters, common buttercup, Canada thistle and field horsetail</li> <li>- exhibits some forms of past agricultural uses, as evidence by sheds other structures</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| SWDM2-2 | green ash mineral deciduous swamp type | <ul style="list-style-type: none"> <li>- deciduous treed swamp with a closed canopy, dominated by green ash and white elm</li> <li>- other woody associates include scattered specimens of hybrid willow, crack willow, trembling aspen, cottonwood, red-osier dogwood and alternate-leaved dogwood</li> <li>- barren soils and sparse groundcover indicative of standing water present during growing season</li> <li>- groundflora includes fringed loosestrife, yellow rocket, yellow avens, herb-robert, moneywort, Virginia creeper and poison ivy</li> <li>- staked (with MNR) and delineated as part of provincially significant Silver Creek Wetland Complex</li> </ul>                                                                                                                                                                                                                                                                  |
| SWDM3-1 | red maple mineral deciduous swamp type | <ul style="list-style-type: none"> <li>- narrow troughs of treed swamp lying between narrow upland ridges, with an east to west orientation</li> <li>- closed canopy dominated by red maple and green ash</li> <li>- other woody associates include black ash, yellow birch, trembling aspen, white elm, balsam poplar, alternate-leaved dogwood, red-osier dogwood, bush honeysuckle and scattered eastern white cedar</li> <li>- contains pools of standing stagnant water throughout most of growing season</li> <li>- wet-mucky mineral soils vegetated by marsh fern, sensitive fern, water horsetail, fringed loosestrife, cleavers, clearweed, hop sedge, crested fern, beggar-ticks, blue flag, interior sedge, tall meadowrue, water parsnip, soft-stem bulrush, ostrich fern and fragrant bedstraw</li> <li>- three units staked (with MNR) and delineated as part of provincially significant Silver Creek Wetland Complex</li> </ul> |

|         |                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SWDM4-5 | poplar mineral deciduous swamp type                    | <ul style="list-style-type: none"> <li>- situated along northern edge of property, dominated by trembling aspen, balsam poplar, white birch, red-osier dogwood, green ash, meadowsweet and white elm</li> <li>- contains wet to saturated mineral soils, with pockets of standing water</li> <li>- groundflora contains awl-fruited sedge, interior sedge, sensitive fern, ostrich fern, marsh fern, fragrant bedstraw, fringed loosestrife, water horsetail, deadly nightshade, water horehound, rice cut grass and wild mint</li> <li>- staked (with MNR) and delineated as part of provincially significant Silver Creek Wetland Complex</li> </ul>                                                                                                                                                            |
| SWMM3-2 | poplar-conifer mineral mixed swamp type                | <ul style="list-style-type: none"> <li>- mesic to wet soils support treed swamp dominated by trembling aspen, large-toothed aspen and eastern white cedar</li> <li>- other woody associates included alternate-leaved dogwood, red-osier dogwood, white elm and green ash</li> <li>- relatively lush groundcover indicates lack of standing water present during growing season</li> <li>- typical groundcover contains fringed loosestrife, wild mint, sensitive fern, blue flag, Jack-in-the-pulpit, mosses, wild grape, narrow-leaved cattail, meadow horsetail, common buttercup, enchanters nightshade, deadly nightshade, water horehound and dwarf raspberry</li> <li>- three units staked (with MNR) with one unit delineated as part of provincially significant Silver Creek Wetland Complex</li> </ul> |
| SWTM2-1 | red-osier dogwood mineral deciduous thicket swamp type | <ul style="list-style-type: none"> <li>- two small pockets dominated by red-osier dogwood, with one unit an inclusion within narrow band of red maple-green ash swamp</li> <li>- other unit is isolated and encompassed within MEFM1-1</li> <li>- both units staked (with MNR) with one unit delineated as part of provincially significant Silver Creek Wetland Complex</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                               |

|          |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MAMM1-3  | reed-canary grass graminoid<br>mineral meadow marsh type | <ul style="list-style-type: none"><li>- narrow band of meadow marsh, dominated by reed canary grass and borders both sides of part of Silver Creek</li><li>- other grasses, sedges and forbs include ostrich fern, Canada bluejoint grass, spotted Joe pye-weed, virgin's-bower, Canada anemone, coltsfoot, elecampane, beggar-ticks, spotted jewelweed, wild mint, meadow sedge, blue flag and wood nettle</li></ul> |
| MAMM1-13 | rush graminoid mineral<br>meadow marsh type              | <ul style="list-style-type: none"><li>- small pocket dominated by jointed rush, along with fragrant bedstraw, awl-fruited sedge, meadow sedge, riverbank grape, meadowsweet, blue-eyed grass, deadly nightshade, wild mint, reed canary grass and tall goldenrod</li><li>- staked (with MNR) and delineated as part of provincially significant Silver Creek Wetland Complex</li></ul>                                |

## **4.4 Wildlife Methods**

### **4.4.1. Birds**

Bird surveys were conducted on May 4<sup>th</sup>, 16<sup>th</sup>, June 18<sup>th</sup> and 22<sup>nd</sup>, 2010. The May 16<sup>th</sup> visit was done in the evening to target night calling birds such as; owls, nighthawks, whip-poor-wills and any other potential nocturnal species in the area. Surveys were also completed in 2019. All surveys included early dates and evening visits in order to maximize the species included in the surveys. All observations and data collection were completed by an experienced field biologist. Breeding birds were targeted but incidental observations were recorded as well. Morning surveys were performed between a half hour before sunrise and through to approximately 10:00 AM. The single evening survey was conducted a half hour after sunset through to 10:30 PM.

#### *Dawn Breeding Bird Surveys*

Dawn breeding bird surveys were conducted on June 11 and 27, 2019 under suitable observation conditions as reported in Appendix E on two separate days during the breeding season spaced more a week or more apart as per the general sampling procedures of the Ontario Breeding Bird Atlas (OBBA) project. Surveys were completed as combined roving and point count surveys. Nine point count stations were established on the property as shown on attached Figure 8. Point count survey duration was five minutes per station.

#### *Nocturnal Bird Surveys*

Nocturnal bird surveys were conducted on June 12 and June 15, 2019 to assess use of habitat on and adjacent to the subject lands by Eastern Whip-poor-will (Threatened) and Common Nighthawk (Special Concern). Surveys were completed more than one half hour after sunset and timed to coincide with full to near full moon conditions under the following conditions: June 12 – Start Time 11:07p.m., Air Temperature +18oC, Wind B2 South, Cloud Cover 60%, Moon visible, Observer M. Gillespie; June 15 - Start Time 11:36pm, Air temperature +11oC, Wind B0, Cloud Cover 30-45%, Moon near full fully visible, Observer S. Martin. Surveys were completed as road/trailside point count stations (See Figure 8). Point count survey duration was 15 minutes per station.

### **4.4.2. Bats**

Due to the tree cover on the subject lands and within the general area, the potential for roosting habitat exists on the subject lands. As such, an assessment of the trees on site for the presence of bat maternal colonies and hibernacula was conducted. The methodology used is consistent with that outlined in Bat Driving Transects: Using Acoustic Surveys to Monitor Population Trends in Ontario Bats (OMNRF 2013).

### **4.4.3. Herpetofauna**

On April 14, 23 and June 11, 2010, an HDG biologist attended the site to complete an early, middle and late season assessment of breeding amphibian activities on the subject lands. The subject lands are a mix of fallow farmland (on the western portion) and a deciduous swamp and mixed forest (on the east). The subject lands are traversed by Silver Creek, which flows in a northerly direction. The topography of the subject property was characterized by a distinct series of shallow ridges and low, wet troughs on the east side of Silver Creek that, in most cases, extend in an east-west orientation. The majority of breeding amphibian activity was concentrated on the western most and eastern most sections of the property. Standing water was present in the various locations on the subject property during each of the surveys.

Auditory surveys were conducted using the Canadian Wildlife Service (CWS) Marsh Monitoring Survey Protocol which provides an indication of amphibian abundance during the breeding season using the following scale:

Code 0: no calling amphibians heard;  
Code 1: individuals can be counted, calls not overlapping;  
Code 2: calls overlapping but individuals can still be counted; and,  
Code 3: a full chorus, calls continuous and overlapping, individuals not distinguishable.

In order to update the 2010 inventories, three evening calling amphibian surveys were completed in spring of 2019 following the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Bird Studies Canada, 2008). Five evening calling amphibian point count stations were established in locations shown on attached Figure 8. The observation results of the evening amphibian call surveys are also presented on Figure 8.

Five snake and turtle surveys were also conducted per Provincial protocol between May 28, 2019 and June 9, 2019. A visual encounter survey (VES) was the method used to establish presence/absence. This method is ideal for quickly assessing presence across large areas. (Survey Protocol for Ontario's Species at Risk Snakes, December 2016, Ministry of Natural Resources). For assessing snake presence in thick bush, the protocol involves slowly walking through watching for basking or moving snakes, searching rock piles and artificial cover, which is also referred to as high quality microhabitats. In open-canopy habitats, with lots of ground cover, such as meadows or grassy fields, a walking transect is used. Transects at 5 meters apart is ideal but can fluctuate if microhabitats are inspected.

For turtles, a visual rapid assessment (VRA) was the method used to establish presence/absence. The survey followed same transects as the snake survey unless a pond was encountered then a visual inspection of the pond was undertaken. To limit confusion on which protocol was used, visual encounters were the standard method used for assessing presence/absence for both snakes and turtles. Transects were followed with some deviation if a snake habitat or pond was investigated.

## **4.5 Wildlife Observations**

### **4.5.1. Birds**

Bird surveys were conducted on May 4, 16, June 18 and 22, 2010. The May 16<sup>th</sup> visit was done in the evening to target night calling birds such as; owls, nighthawks, whip-poor-wills and any other potential nocturnal species in the area. The surveys included early dates and evening visits in order to maximize the species included in the surveys. All observations and data collection were completed by an experienced field biologist. Breeding birds were targeted but incidental observations were recorded as well. Morning surveys were performed between a half hour before sunrise and through to approximately 10:00 AM. The single evening survey was conducted a half hour after sunset through to 10:30 PM. A total of 79 species were observed. With the exception of one non-breeding American White Pelican (flying overhead), no Species At Risk from the federal or provincial lists were discovered during the course of these surveys (COSEWIC, COSARRO, NHIC). There were no regionally rare species observed during the surveys. There were 37 species that were found to be Area Sensitive according to the Priorities for Bird Conservation in Southern Ontario (Couturier, 1999). The Area Sensitive Species are listed in Appendix E.

The high percentage of Area Sensitive Species is due the large forested section of the property on the east side of Silver Creek. These forests connect to surrounding forest cover and are part of a much larger contiguous forest in the area. These forests support a good diversity of species and woodlands, in general, including a long list of Area Sensitive Species. Two species of warblers encountered solely on the initial survey in early May were likely migrants – one of these species (Yellow-rumped Warbler) is considered an Area Sensitive



Species and should likely not be considered on a breeding list for this property. Turkey Vultures were observed on all occasions as well but were not likely breeding on the property. The recovering agricultural lands on the west side of the property had 8 species that are considered Area Sensitive for Open-lands type habitats. None of these eight species would be unexpected breeders in the area. A Common Snipe was heard during the evening survey. This species is normally considered an area sensitive bird for Marsh Lands. It does however often call over open fields during territorial displays. It could be using the abandoned fields or the fringe of the ephemeral ponds for breeding grounds.

The Forests on the East half of the subject lands are a mix of young trees with a few larger more mature trees interspersed throughout. These younger wooded sections are not likely as attractive to the birds usually associated with bigger tracks of forest lands and more mature trees. The number of species was low and the diversity seemed less than would be expected. The canopy is fragmented in many places where the habitat is still growing in from the previous pasture and agricultural activity on the property. The exception to this is the section of cedars on the south east corner. This area has the most diversity of birds and likely the most active territories. The warblers were abundant here and this section accounts for a good proportion of the other area sensitive forest species. A small undefined swale almost bisects the property in half running from south to north towards the Bay. There is a good mix of riparian and transitional habitat around the banks of this creek. The bird species are a mix of open and forested habitats plus the usual edge preferring species. There were a few invasive species such as Cowbirds and Starlings evident through this section. The fields on the west portion of the property had a good representation of open-land birds and there are two wet areas that were likely attracting the wetland birds. These wet areas likely dry up on a regular basis as the summer progresses.

There was a single Red-tailed Hawk on the edge of the open areas in the June surveys. This bird did not react defensively and did not behave in any other way as to suggest there was a nest nearby. Stick nests were specifically targeted on the initial early survey in May. None were discovered.

The surrounding lands have many forms of disturbance and altered habitats. The range of residential housing areas and golf course to highway corridor and Georgian trail make this property appear to be a haven of more natural habitats. The property has a tradition of being used for cattle pasture and other mixed agriculture. There are a few trails that wind through the forest. Evidence of minor logging is present as well.

Incidental sightings of bird species were also recorded during the June 3 – 4, 2010 inventory of vegetation. These sightings included the single occurrence of a fly-over of a non-breeding American White Pelican (*Pelecanus erythrorhynchos*). Sightings of this bird occur infrequently in the Collingwood area. The White Pelican is considered Threatened Provincially but is not at-risk Nationally.

#### *2019 Dawn Breeding Bird Surveys*

All bird species seen and/or heard on or adjacent to the subject lands were recorded during the June 11 and 27, 2019 inventories. Observations were coded in regard to breeding evidence as per the descriptions provided in Appendix E and breeding evidence for the property was assigned based on the classification scheme of the OBBA project.

Lands west of Silver Creek provided habitat for Eastern Meadowlark (Threatened – 4 singing males/territories) and Bobolink (Threatened – 3 singing males/territories) as shown on attached Figure 8. Eastern Wood-pewee (Special Concern – 3 singing males/territories) were detected in woodlands east and west of Silver Creek as shown on attached Figure 8.

### 2019 Nocturnal Bird Surveys

No nocturnal birds were detected on or adjacent to the Huntingwood lands during investigations on June 12 and 15, 2019. Calling by Eastern Whip-poor Will was detected from "control" sites in Wasaga Beach (UTM 17T 580334 4928004) and near Orr Lake (UTM 17T 593192 4941155), confirming that Eastern Whip-poor-will were actively calling and hence detectable on the evenings sampled.

### 4.5.2. Bats

Detailed results from the acoustic bat monitoring surveys were not available at the time of the completion of this report. The data collected has confirmed the probable presence of SAR bats primarily located within the PSW and associated forested area.

### 4.5.3. Herpetofauna

On April 14th, April 23rd and June 11, 2010 a qualified biologist conducted an amphibian survey on the subject lands. Weather conditions were favorable on all three dates for conducting the surveys. On the date of the first survey, Mr. Clark also walked the site during daylight hours to ensure that the survey could be conducted in a safe and efficient manner. A total of four species of amphibians were heard calling during the three field surveys. The results of the surveys are provided in tables 3, 4 and 5 below and locations are graphically illustrated on Figure 7.

**Table 3. Amphibian Survey Results**

April 14, 2010; 19:39, Air Temperature 11.5°C; Beaufort 0; Cloud Cover 10%; no precipitation

| Station # | GPS Coordinates    | Common Name         | Scientific Name              | Code | Number of Individuals |
|-----------|--------------------|---------------------|------------------------------|------|-----------------------|
|           | 0557927<br>4929037 | Western Chorus Frog | <i>Pseudacris triseriata</i> | 1    | 2                     |
|           | 0557766<br>4929434 | Western Chorus Frog | <i>Pseudacris triseriata</i> | 1    | 2                     |
|           | 0557831<br>4929533 | Spring Peeper       | <i>Pseudacris crucifer</i>   | 3    | -                     |
|           |                    | Western Chorus Frog | <i>Pseudacris triseriata</i> | 1    | 1                     |
|           | 0557836<br>4929559 | Spring Peeper       | <i>Pseudacris crucifer</i>   | 3    | -                     |
|           |                    | Wood Frog           | <i>Rana sylvatica</i>        | 1    | 1                     |
|           | 0557598<br>4929197 | Western Chorus Frog | <i>Pseudacris triseriata</i> | 1    | 1                     |
|           | 0557199<br>4929471 | Western Chorus Frog | <i>Pseudacris triseriata</i> | 1    | 2                     |
|           |                    | Spring Peeper       | <i>Pseudacris crucifer</i>   | 1    | 1                     |

**Table 4. Amphibian Survey Results**

April 23, 2010; 21:22, Air Temperature 10°C; Beaufort 0; Cloud Cover 20%; no precipitation

| Station # | GPS Coordinates    | Common Name         | Scientific Name              | Code | Number of Individuals |
|-----------|--------------------|---------------------|------------------------------|------|-----------------------|
|           | 0557234<br>4929463 | Western Chorus Frog | <i>Pseudacris triseriata</i> | 1    | 1                     |
|           | 0557184<br>492435  | Western Chorus Frog | <i>Pseudacris triseriata</i> | 2    | 4                     |
|           | 0557354<br>4929325 | Spring Peeper       | <i>Pseudacris crucifer</i>   | 1    | 1                     |

|  |                    |               |                            |   |   |
|--|--------------------|---------------|----------------------------|---|---|
|  | 0557839<br>4929571 | Spring Peeper | <i>Pseudacris crucifer</i> | 1 | 2 |
|  |                    | Spring Peeper | <i>Pseudacris crucifer</i> | 1 | 1 |

**Table 5. Amphibian Survey Results**

June 11, 2010; 21:48, Air Temperature 17°C; Beaufort 1; Cloud Cover 75%; no precipitation

| Station # | GPS Coordinates    | Common Name    | Scientific Name        | Code | Number of Individuals |
|-----------|--------------------|----------------|------------------------|------|-----------------------|
|           | 0557230<br>4929470 | Grey Tree Frog | <i>Hyla versicolor</i> | 1    | 2                     |
|           | 0557901<br>4929415 | Grey Tree Frog | <i>Hyla versicolor</i> | 2    | 4                     |
|           | 0557907<br>4929652 | Grey Tree Frog | <i>Hyla versicolor</i> | 2    | 3                     |
|           |                    | Green Frog     | <i>Rana clamitans</i>  | 1    | 1                     |

Updated Breeding Amphibian field investigations in 2019 identified three centres of amphibian breeding activity as shown on Figure 8. Evening calling surveys were conducted on April 30 (early season), May 22 (mid season) and June 13 (late season). Results for the surveys are noted in the tables below.

**Table 6. Amphibian Survey Results**

April 30, 2019; 21:33, Air Temperature 6°C; Beaufort 2; Cloud Cover 60%; very light mist; crescent moon

| Calling Location # | Common Name           | Scientific Name            | Code | Number of Individuals |
|--------------------|-----------------------|----------------------------|------|-----------------------|
| 1                  | No Activity           |                            |      |                       |
| 2                  | Spring Peeper         | <i>Pseudacris crucifer</i> | 1    | 7                     |
|                    | Northern Leopard Frog | <i>Lithobates pipiens</i>  | 1    | 2                     |
| 3                  | Spring Peeper         | <i>Pseudacris crucifer</i> | 2    | 7                     |

**Table 7. Amphibian Survey Results**

May 22, 2019; 21:48, Air Temperature 13°C; Beaufort 2; Cloud Cover 75%; no precipitation; moon not visible

| Calling Location # | Common Name           | Scientific Name              | Code | Number of Individuals |
|--------------------|-----------------------|------------------------------|------|-----------------------|
| 1                  | Spring Peeper         | <i>Pseudacris crucifer</i>   | 3    |                       |
| 2                  | Spring Peeper         | <i>Pseudacris crucifer</i>   | 3    |                       |
|                    | Western Chorus Frog   | <i>Pseudacris triseriata</i> | 1    | 2                     |
|                    | Northern Leopard Frog | <i>Lithobates pipiens</i>    | 1    | 1                     |
|                    | American Toad         | <i>Anaxyrus americanus</i>   | 1    | 1                     |
| 3                  | Spring Peeper         | <i>Pseudacris crucifer</i>   | 3    |                       |

**Table 8. Amphibian Survey Results**

June 13, 2019; 23:30, Air Temperature 16°C; Beaufort 2; Cloud Cover 60%; no precipitation; moon not visible

| Calling Location # | Common Name    | Scientific Name        | Code | Number of Individuals |
|--------------------|----------------|------------------------|------|-----------------------|
| 1                  | No Activity    |                        |      |                       |
| 2                  | Gray Tree Frog | <i>Hyla versicolor</i> | 1    | 3                     |

|   |                |                        |   |   |
|---|----------------|------------------------|---|---|
| 3 | Green Frog     | <i>Rana clamitans</i>  | 1 | 5 |
|   | Gray Tree Frog | <i>Hyla versicolor</i> | 1 | 2 |

Snake and turtle surveys were conducted between May 18, 2019 and June 9, 2019 and no species of either were observed during the 5 visits.

No reptile Species at Risk (SARO) were observed or reported on the subject property. Species at Risk Reptiles that were investigated for included Massasauga Rattlesnake - Great lakes-St. Lawrence Population (THR), and Eastern Hog-nose Snake (THR), both of which have one sighting in the sampling areas before 1999 (Ontario Nature). The Spotted Turtle and Wood Turtle are both listed as (END) and The Blanding's Turtle is (THR) and has not been reported in the sampling area (Ontario Nature).

#### 4.5.4. Incidental Wildlife

Mammals observed on site in 2010 include the Raccoon (*Procyon lotor*) and the White-Tailed Deer (*Odocoileus virginianus*), Coyote (*Canis latrans*), Red Fox (*Vulpes vulpes*), Eastern Cottontail (*Sylvilagus floridanus*), Red Squirrel (*Tamiasciurus hudsonicus*), Eastern Grey Squirrel (*Sciurus carolinensis*) and Eastern Chipmunk (*Tamias striatus*).

#### 4.5.5. Fisheries

Silver Creek is a locally unique feature in that it provides high quality coldwater stream habitat extending from the Niagara Escarpment all the way north to Georgian Bay (East Black Bass Bay). Coldwater habitat in most of our other local Georgian Bay tributaries (e.g. Pretty River), suffers from land use impacts and a lack of groundwater discharge in the northern/downstream portion of the watershed.

Silver Creek is well known as a migratory rainbow trout spawning/nursery habitat, where juvenile rainbow trout typically spend the first two and often 3 years of their lifecycle in the stream before migrating out to Georgian Bay to begin the adult portion of their lifecycle. After 1 to 2 years (males) or 2 to 3 years (females) in the lake, the adult rainbow trout return to Silver Creek on a spawning run, typically between October and May.

Less well known is that Silver Creek also provides spawning/nursery habitat for chinook salmon (1993 study). Juvenile fish spend typically 3 months, but often a full year in the creek before moving out to Georgian Bay to begin the adult phase of their lifecycle. Adults enter Silver Creek in September and October to spawn and may require rainfall and associated high flow events to enhance access to Silver Creek for these large fish (Pers. Comm. Fred Dobbs, NVCA).

#### 4.5.6. Habitat Connectivity/Linkage

The woodland on the subject property is part of a large woodlot area which extends off-site to adjacent lands. A corridor containing Silver Creek and associated buffer will allow for linkages to the onsite woodlands and north and south to natural habitat located on adjacent lands.

## 5.0 Significant Natural Heritage Features

The following is an assessment of significant natural heritage features that must be included in the environmental assessment of proposed developments. Under the Provincial Policy Statement, it is the responsibility of the planning authorities to identify significant natural heritage features, including significant valleylands, wetlands, woodlands, and wildlife habitat. The following sections provide an evaluation of the subject property's existing features in

context with the MNR criteria for the identification of significance under the Provincial Policy Statement and the related potential impacts associated with the development proposal. These criteria are detailed in the Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement (April 2010).

## **5.1 Significant Valleylands**

There are no significant valleylands on the subject lands.

## **5.2 Significant Woodlands**

The PPS states that development and site alteration may be permitted in significant woodlands provided that there will be no negative impacts to the identified natural features and functions that lend significance to the woodland. Woodlands as defined by the PPS are:

*“treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products.*

*Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels.”*

Significant, with regards to woodlands is defined in the PPS as:

*“an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history”.*

The Natural Heritage Reference Manual outlines the recommended Significant Woodland Evaluation Criteria and Standards using woodland size, ecological function, possession of uncommon characteristics and economic and social values to determine the woodland's significance. Those criteria are explained and weighed against the characteristics of the subject property below.

### **5.2.1. Woodland Size**

- Woodland areas are considered to be generally continuous even if intersected by narrow gaps 20 m or less in width between crown edges.
- Size value is related to the scarcity of woodland in the landscape derived on a municipal basis with consideration of differences in woodland coverage among physical sub-units (e.g., watersheds, biophysical regions).
- Size criteria should also account for differences in landscape-level physiography (e.g., moraines, clay plains) and community vegetation types.

The woodland area within the subject lands is part of a large woodland area which extends south on adjacent lands. The whole woodland area has been subjected to disturbance for agricultural uses, golf course, construction and residential development.

### **5.2.2. Ecological Function**

#### *a) Woodland Interior*

- Interior habitat more than 100 m from the edge (as measured from the limits of a continuous woodland as defined above) is important for some species.
- For purposes of this criterion, a maintained public road would create an edge even if the opening was not wider than 20 m and did not create a separate woodland.

*b) Proximity to other woodlands or other habitats*

- Woodlands that overlap, abut or are close to other significant natural heritage features or areas could be considered more valuable or significant than those that are not.
- Patches close to each other are of greater mutual benefit and value to wildlife.

Adjacent to the subject lands is another small wooded area within the Silver Glen Preserve development to the west. The existing watercourse corridor adjacent to woodlands will be retained in the development proposal and will have a buffer which will preserve a corridor through to the woodlands on the east side of the property and to adjacent lands which also contain woodland in the east, south and north.

*c) Linkages*

- Linkages are important connections providing for movement between habitats.
- Woodlands that are located between other significant features or areas can be considered to perform an important linkage function as "stepping stones" for movement between habitats.

Linkages to the woodland areas within the subject lands exist in portions of the east, north and south boundaries of the subject lands as the woodlands has been disturbed where other abutting residential, agricultural and golf course uses exist. The corridor containing the watercourse feature and associated buffer will allow for an important north-south linkage to be retained through the proposed development lands.

*d) Water Protection*

- Source water protection is important.
- Natural hydrological processes should be maintained.

The subject lands are not located within a sensitive or threatened watershed.

*e) Woodland Diversity*

- Certain woodland species have had major reductions in representation on the landscape and may need special consideration.
- More native diversity is more valuable than less diversity.

The wooded vegetation communities found on the subject lands are typical of what is expected in this area of Ontario.

**5.2.3. Uncommon Characteristics**

- *Woodlands that are uncommon in terms of composition, cover type, quality, age and age structure should be protected;*
- *Older woodlands (i.e. woodlands greater than 100 years old) are particularly valuable for several reasons including their contributions to genetic, species and ecosystem diversity.*

The woodlands present on the subject lands do not contain any uncommon woodland types and are not greater than 100 years old.

#### 5.2.4. Economic and Social Values

- *Woodlands that have high economic or social values through particular site characteristics or deliberate management should be protected.*

There are no managed woodlands on the subject lands.

### 5.3 Significant Wetlands

The boundaries of a total of eight (8) wetland features on the Huntingwood Trails property were flagged by an HDG qualified wetland evaluator and surveyed in 2010. One of these wetland features fronts onto Highway 26 and has been designated and mapped by the MNR as part of the Provincially Significant Wetland (PSW), known as the Silver Creek Wetland Complex. The edges of this particular on-site wetland feature were flagged and boundary adjustments confirmed by MNR Midhurst District Office staff on August 5, 2010. Subsequently, the boundaries of the remaining seven (7) wetland features internal to the property were flagged and confirmed by MNR on September 22, 2010. Figure 6 shows the location and extent of each of the unevaluated wetland features, which have been labeled A-G for ease of description and reference. The boundary of the MNR mapped Silver Creek PSW feature that fronts onto Highway 26 is also included. MNRF has incorporated the other un-evaluated (internal) wetland features into the Silver Creek PSW that qualified for inclusion within the PSW complex.

Table 9 contains a summary description of the seven wetland features (A-G). Data includes: size (in hectares); typical and specialized attributes, if any (e.g. vegetation forms such as treed swamp-h, shrub thicket swamp- ts or ls, sedge marsh-ne or the presence of rare flora or fauna); and typical and specialized ecological functions, if any (e.g., breeding habitat for amphibians, raptor nests, gestation or hibernacula for fauna, fish and fish habitat), as well as relevant comments.

In general, and according to the Ontario Wetland Evaluation System (OWES) – Southern Manual (Ministry of Natural Resources 1993, with updates), “wetland smaller than 2.0 ha (5 acres) will not be evaluated.” The wetland evaluation protocol also states (page 13) that, “However, very small wetlands can sometimes provide important habitat for wildlife or be important for other reasons. This is particularly true in wetland complexes. Wetlands smaller than 2 ha can be evaluated and the rationale for including them attached to the data record.” The internal wetlands on the Huntingwood Trails property all lie within 750 m of another unit of the Silver Creek Wetland Complex, and therefore can be considered for inclusion within the complex. However, there are other parameters to consider when determining whether a wetland feature should be included within a wetland complex (e.g., minimum vegetation community size of 0.5 ha, specialized attributes and functions). Based on the results of the boundary delineation conducted in August and September 2010 and an analysis of wetland attributes and functions, it was concluded that three of the internal wetland features (labeled D, F and G) on Figure 6 did not warrant inclusion into the PSW, based primarily on their small size (<< 0.5 ha). MNRF agreed with this conclusion and as such, the official MNRF approved wetland areas within the subject lands are labelled on Figure 6 as A, B, C, E,

**Table 9. Summary of Huntingwood Trails Property Wetland Features**

| Wetland | Size (ha) | Attributes and Functions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Comments                                                                                                                                                                               |
|---------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A       | 1.01      | <ul style="list-style-type: none"> <li>- vegetation communities of sufficient size (&gt;0.5 ha)</li> <li>- comprised of treed swamp (S), dominated by green ash, red maple and white elm</li> <li>- wetland vegetation forms include h, ls, gc, m, u</li> <li>- contains standing water 10-30 cm throughout plant growing season, until early August</li> <li>- contains amphibian breeding habitat based on calls heard during April 14 and June 11, 2010, as well as sightings during the 2019 field inventories</li> </ul>                                    | <ul style="list-style-type: none"> <li>- wetland feature qualified for inclusion within Silver Creek Wetland Complex as per site assessment with MNRF on September 22, 2010</li> </ul> |
| B       | 0.75      | <ul style="list-style-type: none"> <li>- vegetation communities of sufficient size (&gt;0.5 ha)</li> <li>- comprised of treed swamp (S), dominated by green ash, red maple and white elm and small inclusion of shrub thicket swamp dominated by dogwoods and willows</li> <li>- wetland vegetation forms include h, ls, gc, m, u; ts, ls, gc, ne, u</li> <li>- contains standing water 10-15 cm throughout plant growing season, until early August</li> <li>- contains amphibian breeding habitat based on sightings during other field inventories</li> </ul> | <ul style="list-style-type: none"> <li>- wetland feature qualified for inclusion within Silver Creek Wetland Complex as per site assessment with MNRF on September 22, 2010</li> </ul> |
| C       | 0.99      | <ul style="list-style-type: none"> <li>- vegetation communities of sufficient size (&gt;0.5 ha)</li> <li>- comprised of treed swamp (S), dominated by green ash, red maple and white elm and shrub thicket swamp dominated by dogwoods and willows</li> <li>- wetland vegetation forms include h, ls, gc, m, u; ts, ls, gc, ne, u</li> </ul>                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>- wetland feature qualified for inclusion within Silver Creek Wetland Complex as per site assessment with MNRF on September 22, 2010</li> </ul> |



|   |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |      | <ul style="list-style-type: none"> <li>- contains standing water 10-15 cm throughout most of plant growing season, until early August</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| D | .063 | <ul style="list-style-type: none"> <li>- vegetation community totals only .063 ha on-site (combined with off-site portion for a total of 0.13 ha)</li> <li>- dominated by green ash, poplars and dogwoods</li> <li>- fairly developed ground flora, indicates lack of standing water during plant growing season</li> <li>- does not contain standing water during amphibian breeding season (April – June), no calls heard during April and June amphibian surveys</li> </ul>                                                                                       | <ul style="list-style-type: none"> <li>- vegetation community of insufficient size (0.13 ha), significantly less than OWES minimum size of 0.5 ha</li> <li>- does not contain any highly specialized plant communities</li> <li>- does not contain any other specialized attributes or functions such as: amphibian breeding habitat; rare flora and/or fauna; nesting raptors; nesting colonial birds; gestation and/or hibernacula for snakes;</li> <li>- feature should be classified as a lowland moist forest (e.g., FOD7-2)</li> <li>- did not warrant inclusion within Silver Creek Wetland Complex as per site assessment with MNRF on September 22, 2010</li> </ul> |
| E | 0.51 | <ul style="list-style-type: none"> <li>- vegetation community on-site of sufficient size (&gt;0.5 ha) , along with an additional smaller contiguous off-site portion (approx. 0.15) to the east</li> <li>- comprised of treed swamp (S), dominated by green ash, red maple, white elm and dogwoods</li> <li>- wetland vegetation forms include h, ts, ls, gc, m, u</li> <li>- contains standing water 10-15 cm throughout most of plant growing season, until early August</li> <li>- amphibians observed and heard calling during 2019 field inventories</li> </ul> | <ul style="list-style-type: none"> <li>- wetland feature qualified for inclusion within Silver Creek Wetland Complex as per site assessment with MNRF on September 22, 2010</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| F | 0.15 | <ul style="list-style-type: none"> <li>- vegetation community totals only 0.15 ha</li> <li>- dominated by poplars, white elm, green ash and dogwoods</li> <li>- well-developed ground flora of grasses, sedges and ferns, indicates lack of standing water during plant growing season</li> <li>- does contain some standing water during early spring (April), but dry from early May onwards,</li> </ul>                                                                                                                                                           | <ul style="list-style-type: none"> <li>- vegetation community of insufficient size (0.15 ha), significantly less than OWES minimum size of 0.5 ha</li> <li>- does not contain any highly specialized plant communities</li> <li>- does not contain any other specialized attributes or functions such as: rare flora and/or fauna; nesting raptors; nesting colonial birds; gestation and/or hibernacula for snakes;</li> <li>- feature should be classified as a lowland moist forest (e.g., FOD7-2), with an inclusion of red-osier mineral thicket (CUT1-E)</li> </ul>                                                                                                    |

|                       |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |      | only one western chorus frog heard on April 14, 2010 no more calls during April 23 and June 11, 2010 amphibian surveys                                                                                                                                                                                                                                                                                                                                                                                                                                                       | - small size and lack of any specialized attributes and functions precluded inclusion within Silver Creek Wetland Complex as per site assessment with MNRF on September 22, 2010                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| G                     | .072 | <ul style="list-style-type: none"> <li>- vegetation community totals only .072 ha</li> <li>- dominated by poplars, cedar, elm and dogwoods</li> <li>- well-developed groundcover of ferns and forbs</li> <li>- contains no standing water during amphibian breeding season (April – June)</li> </ul>                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>- vegetation community of insufficient size (.072 ha), significantly less than OWES minimum size of 0.5 ha</li> <li>- does not contain any highly specialized plant communities</li> <li>- does not contain any other specialized attributes or functions such as: amphibian breeding habitat; rare flora and/or fauna; nesting raptors; nesting colonial birds; gestation and/or hibernacula for snakes;</li> <li>- feature should be classified as a lowland moist forest (e.g., FOD7-2), with an inclusion of red-osier mineral thicket swamp (SWT2-5)</li> <li>- small size and lack of any specialized attributes and functions precluded inclusion within Silver Creek Wetland Complex as per site assessment with MNRF on September 22, 2010</li> </ul> |
| Silver Creek PSW Unit | 4.47 | <ul style="list-style-type: none"> <li>- vegetation communities of sufficient size (&gt;0.5 ha)</li> <li>- comprised mainly of interconnected treed swamps (S), dominated by various combinations of green ash, trembling aspen, hybrid willow, red maple, white elm, dogwoods and shrub willows</li> <li>- also contains a block sedge meadow</li> <li>- wetland vegetation forms include h, ls, gc, m, u; ts, ls, gc, ne, u; gc, ne, be, m</li> <li>- contains pockets of standing water 5-10 cm throughout most of plant growing season, until early September</li> </ul> | <ul style="list-style-type: none"> <li>- wetland feature(s) on-site already mapped and included within Silver Creek Wetland Complex</li> <li>- adjustments undertaken to boundary on August 5, 2010 resulted in some removal of "green ash and willow treed swamp", more appropriately classified as lowland moist forest (e.g., FOD7-2, FOD7-3) and the addition of a block of sedge meadow (vegetation forms - gc, ne, be, m)</li> </ul>                                                                                                                                                                                                                                                                                                                                                            |

## **5.4 Significant Wildlife Habitat Assessment**

Significant Wildlife Habitat can be difficult to appropriately determine at the site-specific level, as in many cases the assessment must incorporate information from a wide geographic area and consider other factors such as regional resource patterns and landscape effects.

The Significant Wildlife Habitat Technical Guide identifies four principal components of Significant Wildlife Habitat. These are:

- Seasonal concentrations of animals;
- Animal movement corridors;
- Rare vegetation communities or specialized habitats; and
- Habitat of species of conservation concern.

### **5.4.1. Seasonal Concentrations of Animals**

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

No seasonal concentrations of animals as defined in the Significant Wildlife Habitat Technical Guide (MNR, 2000) were identified on the subject lands during the field investigations.

### **5.4.2. Animal Movement Corridors**

Landscape connectivity (often referred to as "wildlife corridors") has become recognized as an integral part of natural heritage planning and a wide range of benefits have been attributed to the maintenance or re-connection of the undisturbed landscape. In essence, corridors are relatively protected passageways for animals to move between areas of high habitat importance. Conservation of distinct habitat types to protect species is not effective unless the corridors between them are also protected.

The woodland on the subject property, as described in 4.2.2, is part of a large woodlot area which extends off-site to adjacent lands. A corridor containing Silver Creek and associated buffer will allow for linkages to the onsite woodlands and north and south to natural habitat located on adjacent lands.

### **5.4.3. Rare Vegetation Communities or Specialized Habitats**

Vegetation communities that by definition and designation are considered rare or significant include wetland features: SWDM2-2 (green ash mineral deciduous swamp); SWDM4-5 (poplar mineral deciduous swamp); and MAMM1-13 (rush graminoid mineral meadow marsh). All three wetland features lie within a portion of the Silver Creek Wetland Complex, a provincially significant wetland (PSW).

In addition, there are other internal unevaluated wetland features that have been delineated and flagged and subsequently confirmed by MNR staff. These include: three units of SWDM3-1 (red maple mineral deciduous swamp); three units of SWMM3-2 (poplar-conifer mineral mixed swamp); and one unit of SWTM2-1 (red-osier dogwood mineral deciduous thicket swamp). Another unit of SWTM2-1 lies (as an inclusion) within a unit of SWDM3-1. As noted in Section 5.3, digital mapping of these approved internal unevaluated wetland features were provided to the MNRF (See Figure 6). For the purposes of this report all of these wetland features have been considered Provincially Significant.

A review of the data collected indicated that none of the on-site terrestrial features lie within a Life Science or Earth Science Area of Natural and Scientific Interest (ANSI), Environmentally Significant

Area (ESA), or any of the other key natural heritage features (e.g., significant habitat of endangered species and threatened species, significant wildlife habitat, significant valleyland) listed in the *Provincial Policy Statement* (Province of Ontario 2014).

None of the cultural features (e.g., MEFM4, MEFM1-1), lowland forested stands (FODM7-2, FODM7-3), lowland woodland (WODM5-1) are designated significant.

The Town of Collingwood Official Plan Schedule A – Land Use Plan identifies a major portion of the property as lying within lands designated as “Environmental Protection” (The Town of Collingwood, January 2019). These lands are deemed to warrant protection due to their environmental importance and are also shown in greater detail on Schedule B Environmental Protection – Natural Heritage Resources Areas.

A search of the Natural Heritage Information Centre (NHIC) database was conducted for Area ID occurrences of rare vegetation communities, Living Legacy Sites, Areas of Natural and Scientific Interest and specialized habitats on or abutting the subject property. With the exception of the Silver Creek PSW that was noted as a Natural Area, there were no documented records for any on-site or nearby rare vegetation communities, Living Legacy Sites or ANSIs (NHIC 2019).

#### 5.4.4. Species of Conservation Concern

Of the 300+ plant species observed during the June, August and September site inventories in 2010 and supplemented with site inventories conducted in May, June and July 2019, approximately 30% are non-native, and none of the species are listed as rare in Appendix C. None of the plant species observed on-site are considered endangered, threatened or a species of special concern and none are considered rare on a regional or local basis in Simcoe County (Riley 1989). A butternut (*Juglans cinerea*) cruise was also undertaken in the site inventory months, but none were found on-site, although some are known from other local properties. Butternut is listed as Endangered (END) in Ontario under the **Endangered Species Act, 2007** (Province of Ontario 2007).

It is worth noting that in consideration of the Spotted Turtle (*Glemmys guttata*) occurrence known in proximity of the subject lands, in 2010 HDG reviewed the potential of habitat for Spotted Turtle on the subject lands. The occurrence of Spotted Turtle is deemed to be of potential significance to development in the area as it is listed as Endangered in the *Federal Species at Risk Act*, and presence of the species or their habitat would be construed as a significant natural heritage feature. During field investigations, no reptile hibernacula were documented on the property. With emphasis placed on vegetation communities as well as preferred habitat environs, including open wetted areas in full sunshine, it was determined that the combination of vegetation and habitat preferences on the subject lands are not conducive to Spotted turtle presence. There is also no migration corridor or direct connectivity between the subject lands and lands where Spotted Turtle have been identified. Additional surveys completed in May and June 2019 to investigate for turtles and snakes did not identify any specimens.

#### 5.5 Natural Heritage Information Centre

The Natural Heritage Information Centre (NHIC) tracks and maintains data on Canada's endangered species and was consulted as to the listed species on or within the one kilometre grid that includes the subject lands (square 17NK5729). In 2019 a search of the NHIC database for element occurrence or rare species on or abutting the subject property revealed the presence of one (1) element occurrence for rare species and one (1) natural area on or directly adjacent to the subject lands.

Element Occurrence ID 96117 was for a recorded observation of a Snapping Turtle (*Chelydra serpentina*). This turtle species has an SRank of S3 and is listed Federally and Provincially as a Species

of Special Concern. Only those species that are categorized as either Extirpated, Endangered or Threatened are afforded protection under the *Endangered Species Act* and the *Species At Risk Act*.

The Silver Creek Wetland Complex is a Provincially Significant Wetland (PSW) and is recorded as an occurrence of a natural area on or adjacent to the subject lands (EO ID 20093). Portions of the Silver Creek Wetland Complex PSW is located on the subject lands.

## **5.6 Species At Risk**

Species at Risk listed both Federally and Provincially and their preferred habitat were screened to determine whether there is potentially suitable habitat on the subject lands for these species. Based on field surveys conducted on site, the subject lands have been confirmed as providing habitat for Bobolink, Eastern Meadowlark, Eastern Wood Pewee and Western Chorus Frog. Additionally, the subject lands have the potential to provide habitat for bat species. These species will be discussed in detail below.

### *Bobolink/Eastern Meadowlark (Threatened)*

Bobolink and Eastern Meadowlark inhabit large, open expansive grasslands with dense ground cover, hayfields, meadows or fallow fields. 2019 breeding bird surveys confirmed that both of these grassland species are utilizing the subject lands. Approvals from MECP will be required prior to any site alteration or development within the suitable Bobolink/Eastern Meadowlark habitat.

### *Eastern Wood-Pewee (Special Concern)*

The eastern wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It is most abundant in intermediate-age mature forest stands with little understory vegetation. The Pewee was documented during the 20109 breeding bird surveys. Since this species is currently designated as Special Concern, neither the species itself or its habitat is currently protected according to Ontario's ESA.

With the exception of the aforementioned species, none of the other bird species documented on the subject lands are of federal or provincial conservation concern. In order to address the Threatened birds found within the subject lands, approvals from MECP will be required prior to any site alteration or development within the suitable Bobolink/Eastern Meadowlark habitat.

Detailed results from the acoustic bat monitoring surveys were not available at the time of the completion of this report. The data collected has confirmed the probable presence of SAR bats primarily located within the PSW and associated forested area. Approvals from MECP will be required prior to any site alteration or development within suitable bat habitat. Typical responses from MECP to date to address vegetation and removal have generally identified timing windows for removal as the primary requirement.

## **5.7 Fisheries Act**

There will be no direct or indirect impacts to the fisheries resources of Silver Creek as no disturbance to the riparian corridor will occur. Also, stormwater management for internal stormwater draining on the property will be designed to achieve an enhanced level of treatment as per the Ministry of the Environment (MOE) Stormwater Management Planning and Design Manual (March 2003) prior to discharging to the Silver Creek system (See Stormwater Management and Functional Servicing Report by Crozier & Associates, July 2019).

## **6.0 Proposed Development Concept**

The proposed development concept is for the creation of an access road to a proposed residential community with a mixed use of housing types including single family, semi-detached dwellings and townhouse units with a total of approximately 170 units (See Figure 9). The majority of the subject lands will not be developed and will be designated as Environmental Protection.

The Post Development Drainage Plan for the subject lands' proposal was carried out by Crozier & Associates and is described in their Functional Servicing and Stormwater Management Report, dated January 2011 and updated in July 2019. Given the natural segmentation of the site caused by the Silver Creek and associated buffers, runoff generated from the proposed development will be collected and treated in two separate stormwater management facilities. One facility will be required to service the western development area while onsite controls will be required to service the eastern development area (Crozier & Associates, July 2019).

## **7.0 Impacts Assessment**

Potential impacts to the existing natural heritage systems located on the subject and adjacent lands resulting from the proposed development concept were compiled through research of literature and relevant authorities, as well as through on-site analysis.

The subdivision plan for the proposed development has been prepared to avoid impacts to the natural heritage features and functions of the subject and adjacent lands, achieve an economically feasible development, and accommodate engineering requirements. See Figure 10 for an overlay of the proposed development concept in relation to the existing natural features.

A summary of anticipated impacts from development and proposed mitigation is outlined in Table 10.

Table 10 Summary of Potential Impacts

| Category     | Function of Feature                      | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Recommended Mitigations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hydrogeology | Ground Water Recharge and Discharge      | Interception of the groundwater during servicing may facilitate change of the area through pipe bedding granulars, combined with reduction of contributing surface water drainage to the PSWs will impact the features and functions of the wetland(s) if not mitigated. Also, changes in the periodicity of water levels could also alter the patterns of nutrient availability by altering current fluxes in the biogeochemistry and regulation of redox processes. The impacts are dependent on the findings of the geotechnical report together with final design of the SWM system for the proposed development. | <p>That maintenance of the water budget that supports each wetland(s) within the PSW complex be achieved by isolation of the constructed system from the natural wetland system such that no loss of contributing water volume occurs from reduction in stormwater/surface water volumes to the wetland(s). That post-development periodicity of water levels is replicated as best possible through thoughtful SWM design.</p> <p>That servicing corridors/piped systems will be fitted with seepage collars.</p>                                                                                                                                                                                                    |
| Hydrology    | Surface Water Drainage and Recharge      | Changes in the surface water drainage from the Provincially Significant Wetlands are not expected. If there are changes in the surface water regime, the alteration of surface water flow to the PSW could result in drowning, drying out, or changes to soil moisture levels with variable effects in different areas. The stormwater would be treated to conform to MOE standards, thus impacts to the aquatic environment are not expected.                                                                                                                                                                        | Care will be taken during final SWM design at the detailed design stage to ensure that pre and post development water budgets that support wetland(s) closely match. Contributions of treated or clean post development stormwater will be directed to wetland(s) where any reduction in surface flow to wetland(s) occurs.                                                                                                                                                                                                                                                                                                                                                                                           |
| Vegetation   | Rare or Sensitive Species or Communities | The potential impacts resulting from human activity (trampling), vegetation removal, urban runoff, and alterations to the hydrology may affect the nutrient loading and vegetation composition within the wetland and their requisite species. Residential uses are proposed to be located directly adjacent to these features.                                                                                                                                                                                                                                                                                       | <p>There is an approved minimum setback to these features (15m) however the actual setback will provide a buffer to the PSW from between 15m and greater than 50m from built structures.</p> <p>Careful grading drainage design in proximity of these features along with the identified buffer will safeguard any loss of PSW feature or function along with the vegetation noted from this area. A public/resident education program must be developed which raises awareness about the ecological significance of this area and promotes responsible stewardship by abutting landowners.</p>                                                                                                                       |
|              | Woodland                                 | There may be potential impacts to small portions of the Category 1 Woodland that will abut the proposed development footprint. The woodland areas within the PSW troughs will be retained.                                                                                                                                                                                                                                                                                                                                                                                                                            | A vegetation masterplan will be prepared for the project which will analyze trees to be removed within the development footprint, a replanting plan to address newly created edges due to clearing and an associated management strategy to create a sustainable woodland community will be maintained that will endure and demonstrate greater species diversity and provide a broader range of habitat types for wildlife and functional linkages to off site environs. In addition to the requirements of the NVCA, detailed restoration plans and implementation principles will be prepared at the detailed design stage of the project and will generally follow TRCA Post-Construction Restoration guidelines. |
|              | Wetland                                  | Areas of PSW will be removed as a result of construction of the proposed access road (Silver Glen Boulevard) and infrastructure through the site. Potential impacts to the PSW complex include significant changes to the groundwater and surface water regimes due to development and related utility servicing. Community trails have also been discussed as a potential feature within the development. If trails are considered within                                                                                                                                                                            | With regard to the intrusion into the PSW where the proposed access road and infrastructure is proposed, the "cut-offs" of these wetland pieces will not compromise the overall integrity of the wetland complex. The creation of the naturalized SWM facility features proposed with the development plan combined with restoration/naturalization efforts will                                                                                                                                                                                                                                                                                                                                                      |

| Category | Function of Feature                     | Potential Impact                                                                                                                                                                                      | Recommended Mitigations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |                                         | and adjacent to the PSW(s), they may create significant impacts without careful placement, effective design to control pedestrian and pet traffic and development of and education program for users. | <p>assist in maintaining the overall feature and function of the existing wetland complex. In addition to the requirements of the NVCA, detailed restoration plans and implementation principles will be prepared at the detailed design stage of the project and will generally follow TRCA Post-Construction Restoration guidelines.</p> <p>With regard to the PPS and direct impacts to the PSW for an access road, the following is an excerpt from the Town of Collingwood Official Plan, 4.1 Environmental Protection, sub-section 4.1.3.1 Permitted Uses:</p> <p><i>“The uses permitted within the Environmental Protection Areas shown on Schedule A, may include conservation uses, fish and wildlife management, public/private road, public/private utility, public parks, pedestrian (walking, jogging/bicycling/cross country skiing) trails, accessory parking lots or other similar passive recreational uses. Only those building and structures required for purposes of flood control or as accessory uses to public recreation shall be permitted.”</i></p> <p>Furthermore, the PPS recognizes the potential for roads and servicing infrastructure to traverse PSWs.</p> <p>Analysis of the surface water regime has determined that with careful design of SWM features and attention to maintenance of the existing dynamic, impacts to the PSW(s) can be avoided. Individual water balance calculations for each PSW trough (areas) will be completed and post development stormwater volumes contributing to each area will be designed to closely match predevelopment hydrologic conditions. Any proposed pedestrian trails within the development will require on-site review and location by qualified biologists and concerned agencies before being considered further.</p> <p>A minimum buffer setback of 15m has been approved from all PSW(s). This buffer varies in width throughout the site in relation to the proposed development plan.</p> |
| Aquatic  | Fish habitat                            | Silver Creek is a significant watercourse oriented south to north through the site and discharging directly to Georgian Bay. This significant fishery may be impacted by the proposed development.    | A Natural Hazards Study, C.F. Crozier and Associates Inc. (January 2011, updated July 2019) has identified the natural hazards associated with Silver Creek from the perspective of potential flooding and erosion. Additionally, a meander belt assessment of Silver Creek across the subject lands was conducted to determine the erosion hazard limits associated with the unconfined system. The resulting setback/buffer from Silver Creek proper varies from approximately 30m to 90m which will provide a level of protection from the proposed adjacent uses. The Creek and buffers are designated EP pursuant to the approved OPA dated July 31, 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Wildlife | Bat, Bird, Mammal, Herptefaunal habitat | Identified habitat for SAR birds and SAR bats will be either removed or impacted by proposed development.                                                                                             | Consultation with MECP will be completed and the required permitting secured to address impacts to SAR birds and potential disturbance to SAR bats.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |



| Category               | Function of Feature | Potential Impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Recommended Mitigations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |                     | <p>Removal of some of the Category 2 forest cover outside of the PSW may reduce its function as habitat for area sensitive bird species; species with a low tolerance level for urban disturbance would be replaced by species more tolerant of urban settings. It should be noted that trees and vegetation between proposed development and the PSW(s) plus associated buffers/setbacks will be retained. Species tolerant of urban settings would likely occur in higher numbers than elsewhere in non-developed areas; this would lead to some nuisance problems, as well as an increased rate of predation on native birds, mammals and amphibians from an urban area's symptomatic increase in raccoons, skunks, possums, domestic dogs and cats, and feral cats.</p> <p>Community trails have been discussed as a potential feature within the development. Trails with and adjacent to the PSW(s) may create impacts without careful placement, effective design to control pedestrian and pet traffic and development of and education program for users.</p> <p>The most productive amphibian breeding habitat found on site will be retained within the PSW, and the majority of the woodland required for the completion of their life-cycle will remain intact.<br/>The increased vehicular traffic will likely result in an increase in wildlife road mortalities.</p> | <p>Develop and promote a public and resident awareness program stressing the importance of preserving the retained habitat on site and educating all who frequent the site about the species that reside there.</p> <p>Within the portion of the lands to be retained in a natural state as a part of this development proposal, provide enhancements which benefit sensitive species and/or species of conservation concern (add hibernacular, plantings, etc.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Landscape Connectivity | Corridor            | <p>Existing linkages to both on and off-site habitats will be reduced due to implementation of the proposed development.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>Travel corridors and linkage functions through the subject lands will be reduced by the proposed development however the primary corridor, Silver Creek will be retained and enhanced due to ceasing of agricultural operations (cattle grazing) within proximity of the wetted channel. Identified setbacks of 30m – 90m each side and total corridor width of approximately 80m – 125m that will receive stream bank and corridor plantings to restore needed vegetated cover will bolster the linkage function Silver Creek already provides.</p> <p>A travel corridor between Silver Creek and the woodlands located east of the proposed Silver Glen Boulevard extension cannot be fully maintained. A primarily contiguous travel corridor linking the wooded lands south of the Georgian Trail through the development blocks (west side of Silver Glen Boulevard) north to Highway 26 and beyond to the wooded lands north of Highway 26 will remain within the proposed development concept post construction and will provide an ongoing functional corridor for the existing urban tolerant species that inhabit this area.</p> |

## 8.0 Additional Recommendations

Anticipated impacts and proposed mitigation are outlined above in Table 10 and this section presents additional recommendations that should also be considered as part of the detailed design for implementation prior to, during and post-construction to help reduce or eliminate impacts to the identified natural heritage features and functions within or adjacent to the subject lands. As well, these additional recommendations provide guidance to the final detailed design of the development plan as the project proceeds through the detailed design plan process:

1. Development of a Natural Heritage Management Plan and Implementation Principles. This plan will outline the principles to be employed to manage potential impacts in specific areas of the site and set out the mitigation and associated restoration plans.
2. Preparation of a Site Restoration Master Plan. In addition to the requirements of the NVCA, detailed restoration plans will be prepared at the detailed design stage of the project and will generally follow TRCA Post-Construction Restoration guidelines for post-development site restoration.
3. Prior to the commencement of construction, temporary barrier fencing should be installed to protect natural heritage features warranting protection from construction impacts. The barrier fence functions to avoid inadvertent intrusion from operation of machinery or other activities. The fencing should be installed under the supervision of a biologist or landscape architect and maintained to remain in place until final grading and landscaping has been completed.
4. Barrier fencing should be placed at the property line or at the drip-line of trees where trees identified for retention and/or protection are identified. Avoid inadvertent root compaction. In the event that roots or branches of trees to be protected are inadvertently damaged during construction, they should be clean cut as soon as possible. Exposed roots should then be covered with topsoil and mulched under the guidance of a biologist, arborist or landscape architect.
5. Sediment fencing should be erected on the down slope of all excavated material to prevent sediment transport, until full vegetation cover has been achieved on all disturbed areas. The fences should subsequently be monitored on a scheduled basis during construction and checked both before and after all precipitation events to ensure stability.
6. Stormwater management for internal stormwater draining on the property should be designed to achieve an enhanced level of treatment as per the Ministry of the Environment (MOE) Stormwater Management Planning and Design Manual (March 2003).
7. Soft engineering and bioengineering techniques are recommended in favour of hard engineering and hardened structures (i.e. rip rap, concrete) to control surface erosion wherever possible.
8. Erosion and sediment controls must be established in advance of any construction related activities on the property that may affect onsite and adjacent lands;
9. A construction work plan should designate specific locations for stockpiling of soils and other materials, and a spill prevention program should be developed to ensure that vehicle refueling occurs off-site.

10. Areas that are to be cleared for development but are planned to later undergo landscape plantings should implement plans that includes native seed/planting materials wherever appropriate.
11. A naturalized landscaping regime using organic maintenance methods and locally sourced indigenous plants suited to the site's soils is strongly recommended for any necessary revegetation on all new lots, homes and the area within and surrounding the stormwater management facilities, wetland buffer interfaces and the Silver Creek corridor.
12. Future residents must be encouraged to use organic landscaping methods to reduce urban residential-based nutrient contributions to the Provincially Significant Wetland. This would assist with minimizing impacts to the plant community and reduce the chance of non-native or invasive species establishing within the PSW, forested areas within the retained buffers and the Silver Creek corridor.
13. Before construction begins, a botanist or ecologist must be retained to locate and transplant any and all specimens of plants that are considered rare in Simcoe County (if any are encountered), in order to maintain their genetic viability and contribution potential.
14. If pedestrian trails are ultimately proposed as a part of the site plan design, trail-related disturbances to the PSW must be minimized as follows by:
  - o The locations of the planned paths could be jointly located by Biologists and concerned agencies; the location of sensitive species should be identified on site so that the path of the trails can be appropriately located to reduce the impact upon them.
  - o Trails considered on the east side of the subject lands should utilize a range of construction methods to locate along the wetland/upland interface rather than directly in and through PSW areas.
  - o Minimal tree removal should be employed to clear a path for a trail; the trail should remain free of paint and free of the use of salt or sand during the winter.
  - o Interpretive signage planned for the trail should include reminders about proper wetland and creek corridor visitor stewardship (pets on leashes, no littering, remain on trail, leave plants alone, etc.).
15. On-site infiltration and volume reducing strategies must be maximized through design where feasible. Permeable pavement surfaces should be employed where appropriate to ensure a minimal amount of urban residential runoff into the PSW(s).
16. Vegetation clearing should occur outside of the breeding bird season (April 15 to July 30) to prevent nest destruction.

## 9.0 Conclusions

The entirety of the subject lands was inventoried in 2010 and again in 2019 by our team of qualified Biologists representing the fields of terrestrial and aquatic ecology, ornithology, wildlife, bats and fisheries. The inventory work was completed in-season using all recognized protocols for the collection of relevant data. The site generally slopes from the southwest to the northeast with an average slope of less than 1%. All drainage from the western portion of the site outlets to Silver Creek upstream of Highway 26. Drainage for the eastern portion of the site also drains from southwest to northeast and is primarily collected and conveyed in an intermittent drainage channel which outlets under Highway 26 via a 5.5 m x 1.7 m box culvert. There is virtually no surface runoff

contributing to Silver Creek from the lands located east of the creek.

Overall, the subject lands are essentially bisected by a reach of Silver Creek, with tableland on the west side of the creek cleared in the past for agricultural uses (crops and pastureland), characterized as open graminoid meadow and poplar-green ash woodland. The floodplain of the creek contains willow lowland woods, reed canary grass meadow marsh and lowland green ash woods. The eastern portion is covered for the most part by a series of east-west oriented "ridges and troughs". The sandy and sandy-loam ridges are essentially forested with a combination of: upland poplar-birch woods, upland cedar-hardwood mixed woods, upland cedar woods and lowland green ash woods. The clayey troughs are vegetated with various wetland types such as: red maple-green ash treed swamp, poplar-cedar treed swamp, green ash treed swamp, poplar treed swamp, dogwood thicket swamp and rush meadow marsh. There are also blocks and openings of goldenrod forb meadow within the upland woods. Most of the wetland features lie within a portion of the Silver Creek Wetland Complex, a Provincially Significant Wetland (PSW).

None of the on-site features lie within a Life Science or Earth Science Area of Natural and Scientific Interest (ANSI). Areas of the subject lands that are designated as Environmental Protection or any of the other designated key natural heritage features (e.g. significant woodland, significant valleyland, fish habitat) as listed in the Provincial Policy Statement, 2014 (Province of Ontario 2014) are located outside of the area proposed for development.

None of the vascular plant species noted are considered significant or rare either nationally, provincially or regionally, Oldham and Brinker (2009) and Riley (1989).

A search of the Natural Heritage Information Centre (NHIC) database was conducted for Area ID occurrences and Element ID occurrences for rare vegetation communities, rare plant species, Living Legacy Sites, Areas of Natural and Scientific Interest, and specialized habitats on or abutting the subject property. There were no documented records for any on-site rare vegetation communities, rare plant species, Living Legacy Sites or ANSIs (NHIC 2015).

A Significant Wildlife Habitat (SWH) evaluation was undertaken using MNRF protocols and criteria outlined in the MNRF Significant Wildlife Habitat Technical Guide (MNRF 2000).

The subject lands were also surveyed for wildlife and inventory/data collection protocols were completed for breeding birds and breeding amphibians in 2010 and 2019. Per recognized protocols, turtles and bats were also inventoried in 2019. Incidental wildlife observations were also recorded. Although breeding amphibian activity was observed within three areas within the subject lands, only the Western Chorus Frog was identified within lands that will remain as undeveloped and designated as Environmental Protection. Bat survey results were not available at the time of issuance of this report, however initial data from acoustic monitoring indicates that bat habitat does exist within the wooded portions of the subject lands. No other significant mammals were recorded from the subject lands.

Two species of birds that are currently designated as Threatened according to Ontario's Endangered Species Act were documented utilizing the subject lands (Eastern Meadowlark and Bobolink). Eastern Wood-pewee were also observed on the property. The Eastern Wood-pewee is currently designated as Special Concern according to Ontario's ESA and are therefore neither the species itself nor its habitat are currently protected according to the ESA. With the exception of the aforementioned species, none of the other bird species documented from the subject lands are of federal or provincial conservation concern. In order to address the Threatened birds found within the subject lands, approvals from MECP will be required prior to any site alteration or development within the suitable Bobolink/Eastern Meadowlark habitat.

Silver Creek, which bisects the subject lands, is a locally unique feature in that it provides high quality coldwater stream habitat extending from the Niagara Escarpment all the way north to Georgian Bay (East Black Bass Bay). Coldwater habitat in most of the other local Georgian Bay tributaries (e.g. Pretty River), suffers from land use impacts and a lack of groundwater discharge in the northern and downstream portion of the watershed. The proposed stormwater management plan will manage the pre to post development flows such that no increase in peak flows will occur in the existing receiving watercourses. Similarly, stormwater quality objectives will be achieved and facilities design and will comply with the MOE 2003 Stormwater Management Planning and Design Manual.

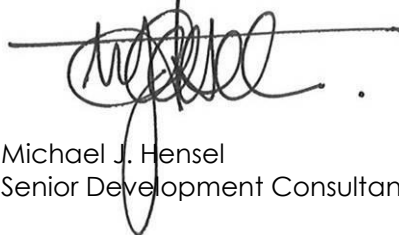
The development plan (roadways, infrastructure and residential uses) also proposes to remove some vegetation on the western portion of the subject lands and a small wooded area on the eastern portion. Both of these areas proposed for development are already designated in the Official Plan as Residential. The proposed development plan is consistent with the PPS given that there will not be a complete loss of significant habitats, natural heritage features (woodland/wetland) and their inherent ecological functions as a result of implementing the proposed development plan. It is recognized that there will be a reduction in a portion of the woodland/wetland features and ecological functions. Compensation (not like for like) for removal of the woodland and wetland portions will be provided within the proposed stormwater management facility located within the proposed development and in off-site proposed compensation/offsetting areas acceptable to MECP and other agencies such that a net increase in habitat diversity and quality is achieved.

The project team will work with MECP in order to comply with the Species At Risk Act and Endangered Species Act. At this time, several candidate properties have been identified that have the potential to provide habitat benefit offsets and satisfy the associated MECP habitat benefit offset requirements for SAR birds. We are confident that through collaboration with MECP, approvals will be received that will facilitate permits to reconstitute habitat for the two SAR bird species requiring habitat offset and/or provision of replacement alternative nesting structures. Consultation with MECP will also be undertaken to ascertain the appropriate response to any potential impacts to SAR bats. Typical responses from MECP to date to address vegetation and removal have generally identified timing windows for removal as the primary requirement. All SAR related impacts can be satisfied through permitting with MECP.

Based on the information known from the site and the corresponding proposed development plan prepared by KLM Planning Partners Inc. and related engineering by Crozier & Associates, we conclude that the proposed development and associated Zoning and Draft Plan is feasible from a natural heritage perspective, in so long as the recommendations and mitigations herein are implemented. If the planning process including Zoning, Draft Plan and Site Plans are designed and constructed as outlined to-date, the ultimate development will not impact the existing ecological features or functions of the natural heritage system overall because the removed natural heritage features and functions will have been replaced through compensation/offsetting initiatives located both within the subject lands and on off-site areas.

Respectfully submitted by,

**C.F. CROZIER & ASSOCIATES INC.**



Michael J. Hensel  
Senior Development Consultant

MH/sh

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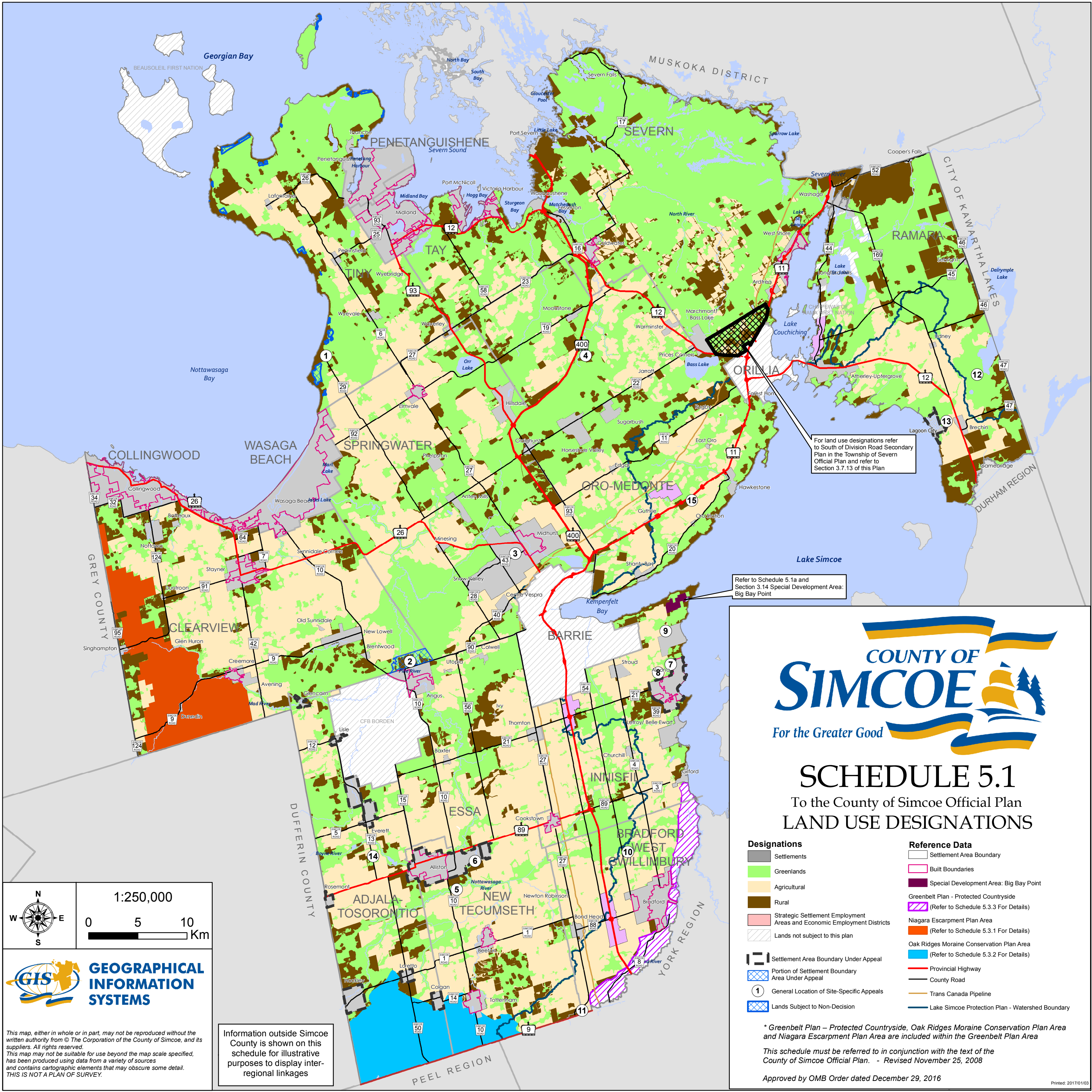
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# APPENDIX A

## Simcoe County Official Plan Schedule 5.1



For land use designations refer to South of Division Road Secondary Plan in the Township of Severn Official Plan and refer to Section 3.7.13 of this Plan

Refer to Schedule 5.1a and Section 3.14 Special Development Area: Big Bay Point

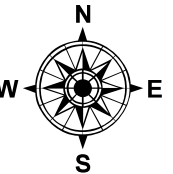


# SCHEDULE 5.1

To the County of Simcoe Official Plan  
LAND USE DESIGNATIONS

- | Designations                                                            | Reference Data                                   |
|-------------------------------------------------------------------------|--------------------------------------------------|
| Greenlands                                                              | Settlement Area Boundary                         |
| Agricultural                                                            | Built Boundaries                                 |
| Rural                                                                   | Special Development Area: Big Bay Point          |
| Strategic Settlement Employment Areas and Economic Employment Districts | Greenbelt Plan - Protected Countryside           |
| Lands not subject to this plan                                          | Niagara Escarpment Plan Area                     |
| Settlement Area Boundary Under Appeal                                   | Oak Ridges Moraine Conservation Plan Area        |
| Portion of Settlement Boundary Area Under Appeal                        | Provincial Highway                               |
| General Location of Site-Specific Appeals                               | County Road                                      |
| Lands Subject to Non-Decision                                           | Trans Canada Pipeline                            |
|                                                                         | Lake Simcoe Protection Plan - Watershed Boundary |

\* Greenbelt Plan - Protected Countryside, Oak Ridges Moraine Conservation Plan Area and Niagara Escarpment Plan Area are included within the Greenbelt Plan Area  
This schedule must be referred to in conjunction with the text of the County of Simcoe Official Plan. - Revised November 25, 2008  
Approved by OMB Order dated December 29, 2016



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**GEOGRAPHICAL INFORMATION SYSTEMS**

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Information outside Simcoe County is shown on this schedule for illustrative purposes to display inter-regional linkages

# APPENDIX B

## Town of Collingwood Official Plan Schedules A and B



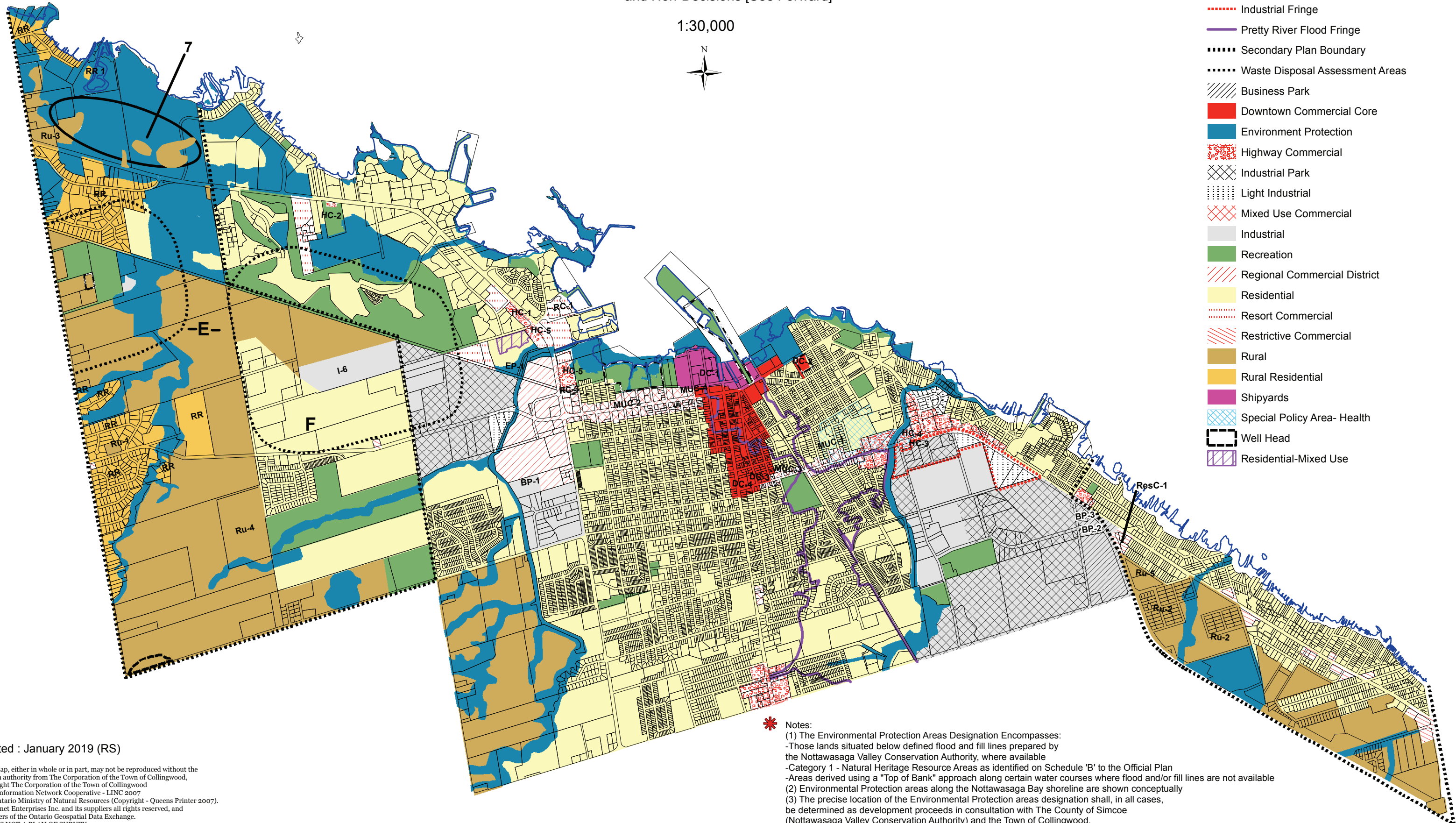


# Official Plan of the Town of Collingwood

## SCHEDULE 'A' - Land Use Plan

Depicting OMB Appeals [See Appellant Chart/Appeal Disposition]  
and Non-Decisions [See Forward]

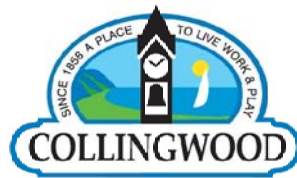
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Printed : January 2019 (RS)

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# Official Plan of the Town of Collingwood

## SCHEDULE 'B' - Environmental Protection-

### Natural Heritage Resource Areas

Legend

--- Fish

**SCHEDULE B**

**NATURAL\_FE**

 CATEGORY 1 VALLEYLANDS

 CATEGORY 1 WETLANDS

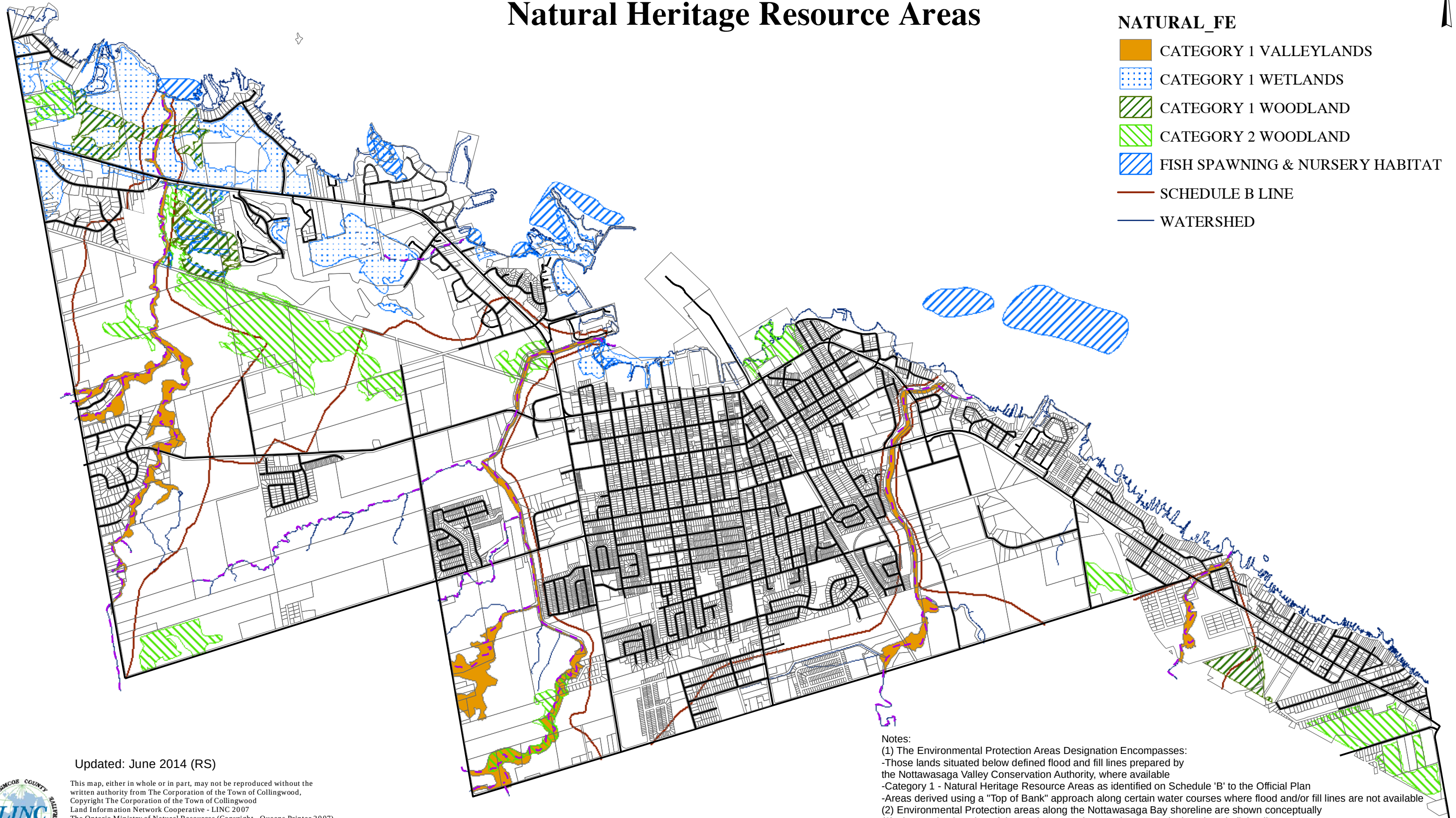
 CATEGORY 1 WOODLAND

 CATEGORY 2 WOODLAND

 FISH SPAWNING & NURSERY HABITAT

 SCHEDULE B LINE

 WATERSHED



#### Notes:

- (1) The Environmental Protection Areas Designation Encompasses:
  - Those lands situated below defined flood and fill lines prepared by the Nottawasaga Valley Conservation Authority, where available
  - Category 1 - Natural Heritage Resource Areas as identified on Schedule 'B' to the Official Plan
  - Areas derived using a "Top of Bank" approach along certain water courses where flood and/or fill lines are not available
- (2) Environmental Protection areas along the Nottawasaga Bay shoreline are shown conceptually
- (3) The precise location of the Environmental Protection areas designation shall, in all cases, be determined as development proceeds in consultation with The County of Simcoe (Nottawasaga Valley Conservation Authority) and the Town of Collingwood.

Updated: June 2014 (RS)

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# APPENDIX C

## Plant Species Observed on the Subject Lands



Appendix C - Huntingwood Trails Property - Master List of Plant Species

| Family/Species                                  | Common Name                         | Status | ELC Code |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
|-------------------------------------------------|-------------------------------------|--------|----------|---------|---------|--------|---------|---------|---------|---------|-------|---------|---------|---------|---------|---------|---------|----------|
|                                                 |                                     |        | FODM3-1  | FODM7-2 | FODM7-3 | FODM11 | FOCM2-2 | FOMM4-3 | WODM5-1 | MEFM1-1 | MEFM4 | SWDM2-2 | SWDM3-1 | SWDM4-5 | SWMM3-2 | SWTM2-1 | MAMM1-3 | MAMM1-13 |
| <b><i>PTERIDOPHYTA</i></b>                      | <b><i>FERNS AND ALLIES</i></b>      |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <b><u>DRYOPTERIDACEAE</u></b>                   | <b><u>WOOD FERN FAMILY</u></b>      |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Athyrium filix-femina (L.)Roth</i>           | Northeastern Lady Fern              |        | x        |         | x       | x      |         | x       | x       |         |       | x       | x       | x       | x       | x       | x       | x        |
| <i>Cystopteris bulbifera (L.) Bern.</i>         | Bulblet Fern                        |        |          |         |         |        | x       | x       |         |         |       |         |         |         | x       |         |         |          |
| <i>Cystopteris tenuis (Michx.)Desv.</i>         | Mackay's Fragile Fern               |        |          |         |         |        |         | x       |         |         |       |         |         |         |         |         |         |          |
| <i>Dryopteris carthusiana (Vill.) H.P.Fuchs</i> | Spinulose Wood Fern                 |        | x        | x       | x       |        | x       | x       | x       | x       |       | x       |         |         |         |         |         |          |
| <i>Dryopteris cristata (L.) Gray</i>            | Crested Wood Fern                   |        |          |         |         |        |         |         |         |         |       |         | x       | x       | x       |         |         |          |
| <i>Dryopteris intermedia (Willd.)</i>           | Glandular Wood Fern                 |        | x        |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Dryopteris marginalis (L.) Gray</i>          | Marginal Wood Fern                  |        |          | x       |         |        |         |         |         |         |       | x       |         |         |         |         |         |          |
| <i>Matteuccia struthiopteris (L.) Todaro</i>    | American Ostrich Fern               |        |          |         | x       | x      |         |         | x       |         |       | x       |         |         | x       |         | x       |          |
| <i>Onoclea sensibilis L.</i>                    | Sensitive Fern                      |        | x        | x       | x       | x      |         | x       | x       | x       | x     | x       | x       | x       | x       | x       | x       | x        |
| <b><u>DENNSTAEDTIACEAE</u></b>                  | <b><u>BRACKEN FAMILY</u></b>        |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Pteridium aquilinum (L.) Kuhn</i>            | Eastern Bracken Fern                |        | x        | x       | x       | x      | x       | x       | x       | x       | x     |         |         |         |         |         | x       | x        |
| <b><u>EQUISETACEAE</u></b>                      | <b><u>HORSETAIL FAMILY</u></b>      |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Equisetum arvense L.</i>                     | Field Horsetail                     |        | x        | x       | x       | x      | x       | x       | x       | x       | x     |         | x       |         |         | x       | x       | x        |
| <i>Equisetum fluviatile L.</i>                  | Water Horsetail                     |        |          |         |         |        |         |         |         |         |       |         | x       | x       |         |         |         |          |
| <i>Equisetum hyemale L.</i>                     | Scouring-rush                       |        | x        |         |         | x      |         |         |         |         | x     |         |         |         |         |         |         |          |
| <i>Equisetum pratense L.</i>                    | Meadow Horsetail                    |        |          |         |         |        |         |         |         |         |       | x       | x       | x       | x       | x       |         | x        |
| <b><u>LYCOPODIACEAE</u></b>                     | <b><u>CLUBMOSS FAMILY</u></b>       |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Lycopodium dendroideum Michx.</i>            | Round-branched Ground-pine          |        |          |         |         |        |         | x       |         |         |       |         |         |         |         |         |         |          |
| <b><u>THELYPTERIDACEAE</u></b>                  | <b><u>BEECH FERN FAMILY</u></b>     |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Thelypteris palustris (Salisb.) Schott</i>   | Marsh Fern                          |        |          |         | x       |        |         |         |         |         |       | x       | x       | x       | x       | x       | x       | x        |
| <b><i>GYMNOSPERMAE</i></b>                      | <b><i>CONIFERS</i></b>              |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <b><u>CUPRESSACEAE</u></b>                      | <b><u>CYPRESS FAMILY</u></b>        |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Juniperus communis L.</i>                    | Common Juniper                      |        | x        |         | x       |        |         |         |         |         | x     |         |         |         |         |         |         |          |
| <i>Thuja occidentalis L.</i>                    | White Cedar                         |        | x        | x       | x       |        | x       | x       | x       | x       | x     | x       |         | x       | x       |         |         | x        |
| <i>Picea glauca (Moench) Voss</i>               | White Spruce                        |        |          |         |         |        |         |         | x       |         |       |         |         |         |         |         |         |          |
| <b><i>LILIOPSIDA</i></b>                        | <b><i>MONOCOTS</i></b>              |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <b><u>ALISMATACEAE</u></b>                      | <b><u>WATER-PLANTAIN FAMILY</u></b> |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Alisma plantago-aquatica L.</i>              | Water-plantain                      |        |          |         | x       |        |         |         |         |         |       |         | x       |         |         | x       | x       |          |
| <b><u>ARACEAE</u></b>                           | <b><u>ARUM FAMILY</u></b>           |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Arisaema triphyllum (L.) Schott</i>          | Jack-in-the-pulpit                  |        |          | x       |         | x      | x       | x       | x       |         |       | x       | x       | x       | x       | x       |         |          |
| <b><u>CYPERACEAE</u></b>                        | <b><u>SEDGE FAMILY</u></b>          |        |          |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Carex sp.</i>                                | Sedge                               |        | x        |         |         | x      | x       | x       | x       | x       | x     | x       | x       | x       | x       | x       | x       | x        |
| <i>Carex arctata Boott</i>                      | Drooping Wood Sedge                 |        |          |         |         |        |         |         |         |         |       | x       | x       | x       | x       | x       |         |          |
| <i>Carex aurea Nutt.</i>                        | Golden Fruited Sedge                |        |          |         |         |        |         |         |         | x       |       |         |         |         |         |         |         |          |
| <i>Carex bebbii (Bailey) Fern.</i>              | Bebb's Sedge                        |        |          | x       | x       | x      |         |         | x       | x       | x     | x       | x       | x       | x       | x       | x       | x        |
| <i>Carex blanda Dew.</i>                        | Woodland Sedge                      |        | x        |         |         |        |         | x       |         |         |       |         |         |         |         |         |         |          |
| <i>Carex brunnescens (Pers.) Poir.</i>          | Brownish Sedge                      |        |          |         | x       |        |         |         |         | x       |       |         |         |         |         |         |         |          |
| <i>Carex communis Bailey</i>                    | Fibrous Rooted Sedge                |        | x        |         |         |        |         |         |         |         |       |         |         |         |         |         |         |          |
| <i>Carex comosa Boott</i>                       | Bristly Sedge                       |        |          |         |         |        |         |         |         |         |       |         | x       | x       | x       |         |         |          |
| <i>Carex deweyana Schw.</i>                     | Dewey's Sedge                       |        | x        |         | x       |        |         |         |         | x       |       |         |         |         | x       |         | x       | x        |
| <i>Carex gracillima Schw.</i>                   | Graceful Sedge                      |        | x        | x       |         |        | x       | x       | x       |         |       |         |         |         |         |         |         |          |
| <i>Carex granularis Muhl. ex Willd</i>          | Sedge                               |        |          |         |         |        |         |         |         | x       | x     | x       |         | x       |         |         | x       | x        |
| <i>Carex gynandra Schw.</i>                     | Sedge                               |        |          |         | x       |        |         |         |         |         |       | x       | x       |         | x       |         |         |          |

|                                                 |                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <i>Carex hystericina</i> Muhl. ex Willd.        | Porcupine Sedge               |   |   |   |   |   |   |   |   |   |   |   | X | X | X | X | X |   |   |
| <i>Carex interior</i> Bailey                    | Inland Sedge                  |   |   |   |   |   |   |   |   |   |   |   | X | X | X | X | X |   |   |
| <i>Carex intumescens</i> Rudge                  | Bladder Sedge                 |   |   |   |   |   |   |   |   |   |   |   | X | X | X | X | X |   |   |
| <i>Carex lupulina</i> Muhl. ex Willd.           | Hop Sedge                     |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |
| <i>Carex radiata</i>                            | Radiating Sedge               |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Carex rosea</i> Schk. ex Willd.              | Rose-like Sedge               |   |   |   |   | X | X | X | X |   |   |   |   |   |   |   |   |   |   |
| <i>Carex stipata</i> Muhl. ex Willd.            | Awl-Fruited Sedge             |   |   |   | X | X |   |   | X | X | X | X | X | X | X | X | X | X | X |
| <i>Carex vulpinoidea</i> Michx.                 | Fox Tail Sedge                |   |   |   | X |   |   |   |   | X |   | X |   |   |   | X |   |   |   |
| <i>Eleocharis erythropoda</i> Steud.            | Spike-rush                    |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| <i>Scirpus atrovirens</i> Willd.                | Black Bulrush                 |   |   |   | X | X |   |   | X | X |   | X | X | X | X |   | X | X | X |
| <i>Scirpus cyperinus</i> (L.) Kunth             | Wool-grass                    |   |   |   | X |   |   |   |   |   |   | X | X |   |   |   | X |   |   |
| <i>Scirpus validus</i> Vahl.                    | Softstem Bulrush              |   |   |   |   |   |   |   |   |   |   | X | X |   |   | X |   |   |   |
| <b><u>IRIDACEAE</u></b>                         | <b><u>IRIS FAMILY</u></b>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Iris versicolor</i> L.                       | Wild Blue Flag                |   |   |   | X |   |   |   |   |   |   | X | X | X | X | X | X | X | X |
| <i>Sisyrinchium montanum</i> Greene             | Little Blue-eyed Grass        |   | X |   | X |   |   |   |   | X | X |   |   |   |   |   |   |   | X |
| <b><u>JUNCACEAE</u></b>                         | <b><u>RUSH FAMILY</u></b>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Juncus articulatus</i> L.                    | Rush                          |   |   |   |   |   |   |   |   | X |   | X |   | X |   |   |   |   | X |
| <i>Juncus bufonius</i> L.                       | Toad Rush                     |   | X |   | X |   |   | X |   | X | X |   |   |   |   |   |   |   |   |
| <i>Juncus effusus</i> L.                        | Rush                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X | X |
| <i>Juncus tenuis</i> Willd.                     | Path Rush                     |   | X | X | X | X |   | X | X | X | X |   |   |   |   |   |   |   |   |
| <b><u>LEMNACEAE</u></b>                         | <b><u>DUCKWEED FAMILY</u></b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Lemna minor</i> L.                           | Common Duckweed               |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   | X |   |   |
| <b><u>LILIACEAE</u></b>                         | <b><u>LILY FAMILY</u></b>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Asparagus officinalis</i> L.                 | Garden Asparagus              | + |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |
| <i>Erythronium americanum</i> Ker               | Yellow Trout Lily             |   | X | X |   |   | X | X | X |   |   |   |   |   |   |   |   |   |   |
| <i>Maianthemum canadense</i> Desf.              | Canada Mayflower              |   | X | X | X |   | X | X | X |   |   | X | X |   | X |   |   |   |   |
| <i>Maianthemum racemosum</i> (L.) Link          | False Solomon's-seal          |   | X |   |   | X |   | X | X | X |   | X |   | X | X |   |   |   |   |
| <i>Maianthemum stellatum</i> (L.) Link          | Starry False Solomon's-seal   |   | X | X | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   |
| <i>Smilax herbacea</i> L.                       | Carrion-flower                |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |
| <i>Trillium erectum</i> L.                      | Purple Trillium               |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |
| <i>Trillium grandiflorum</i> (Michx.) Salisb.   | White Trillium                |   | X |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |
| <b><u>ORCHIDACEAE</u></b>                       | <b><u>ORCHID FAMILY</u></b>   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Cypripedium calceolus</i> L.                 | Yellow Lady-slipper           |   | X |   |   |   | X | X |   | X |   |   |   |   |   |   |   |   |   |
| <i>Epipactis helleborine</i> (L.) Crantz        | Helleborine                   | + | X | X |   |   | X | X | X |   |   |   |   |   | X |   |   |   |   |
| <b><u>POACEAE</u></b>                           | <b><u>GRASS FAMILY</u></b>    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Agropyron repens</i> (L.)                    | Quack Grass                   | + |   |   | X |   |   |   |   | X | X |   |   |   |   |   |   |   |   |
| <i>Agrostis gigantea</i> Roth.                  | Redtop                        | + |   |   | X |   |   |   |   | X | X | X |   |   |   |   | X | X |   |
| <i>Agrostis stolonifera</i> L.                  | Creeping Bent Grass           |   |   |   | X | X |   |   |   |   |   | X | X |   |   | X |   |   |   |
| <i>Bromus inermis</i> Leyss.                    | Smooth Brome Grass            | + |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |
| <i>Bromus tectorum</i> L.                       | Downy Chess                   | + |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |
| <i>Calamagrostis canadensis</i> (Michx.) Beauv. | Canada Blue-joint             |   |   |   | X |   |   |   |   |   |   | X | X | X |   |   | X | X |   |
| <i>Cinna latifolia</i> (Goepp.) Griseb.         | Nodding Wood Grass            |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |
| <i>Dactylis glomerata</i> L.                    | Orchard Grass                 | + | X |   | X |   |   |   |   | X | X |   |   |   |   |   |   |   |   |
| <i>Danthonia spicata</i> (L.) R. & S.           | Poverty Oat Grass             |   | X |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |
| <i>Digitaria sanguinalis</i> (L.) Scop.         | Large Crabgrass               | + |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |
| <i>Festuca pratensis</i> Huds.                  | Meadow Fescue                 | + |   |   | X |   |   |   |   | X | X |   |   |   |   |   |   |   |   |
| <i>Glyceria striata</i> (Lam.) A.S. Hitchc.     | Fowl Manna Grass              |   |   |   | X | X |   |   |   |   |   |   | X | X | X | X | X | X | X |
| <i>Leersia oryzoides</i> (L.) Sw.               | Cut Grass                     |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   | X | X |   |
| <i>Oryzopsis asperifolia</i> Michx.             | Rough-leaved Mountain-rice    |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |
| <i>Panicum capillare</i> L.                     | Witch Grass                   |   | X |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |
| <i>Phalaris arundinacea</i> L.                  | Reed Canary Grass             |   |   | X | X | X |   | X | X | X | X | X | X | X | X |   | X | X |   |



|                                            |                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------------------------------------------|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <i>Phleum pratense L.</i>                  | Timothy                        | + |   |   |   |   |   |   |   | X | X |   |   |   |   | X |   |
| <i>Poa compressa L.</i>                    | Canada Blue Grass              |   | X |   |   |   |   |   |   | X | X |   |   |   |   |   |   |
| <i>Poa palustris L.</i>                    | Fowl Meadow Grass              |   |   |   |   |   |   | X |   |   |   | X |   |   | X |   |   |
| <i>Poa pratensis L.</i>                    | Kentucky Blue Grass            | + |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |
| <i>Schizachne purpurascens (Torr.) Sw.</i> | False Melic Grass              |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   |
| <i>Setaria viridis (L.) Beauv.</i>         | Green Foxtail                  | + |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |
| <b><u>TYPHACEAE</u></b>                    | <b><u>CATTAIL FAMILY</u></b>   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Typha angustifolia L.</i>               | Narrow-leaved Cattail          |   |   |   | X | X |   |   |   |   |   | X | X | X | X | X | X |
| <b>MAGNOLIOPSIDA</b>                       | <b>DICOTS</b>                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <b><u>ACERACEAE</u></b>                    | <b><u>MAPLE FAMILY</u></b>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Acer negundo L.</i>                     | Manitoba Maple                 |   |   | X | X |   |   | X | X | X |   |   |   |   |   |   |   |
| <i>Acer nigrum Michx.</i>                  | Black Maple                    |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |
| <i>Acer rubrum L.</i>                      | Red Maple                      |   | X | X | X | X | X | X | X | X |   | X | X | X | X | X | X |
| <i>Acer saccharum Marsh.</i>               | Sugar Maple                    |   | X |   |   |   | X | X |   |   |   |   |   |   |   |   |   |
| <i>Acer freemani</i>                       | Hybrid Maple                   |   |   |   |   |   |   |   |   |   |   |   | X |   | X | X |   |
| <b><u>AMARANTHACEAE</u></b>                | <b><u>AMARANTH FAMILY</u></b>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Amaranthus powellii S. Wats.</i>        | Green Pigweed                  | + |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |
| <b><u>ANACARDIACEAE</u></b>                | <b><u>CASHEW FAMILY</u></b>    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Rhus radicans L.</i>                    | Poison-ivy                     |   |   | X | X |   |   |   | X | X |   |   | X |   | X |   |   |
| <i>Rhus typhina L.</i>                     | Staghorn Sumac                 |   | X |   |   |   | X | X | X | X |   |   |   |   |   |   |   |
| <b><u>APIACEAE</u></b>                     | <b><u>CARROT FAMILY</u></b>    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Cicuta bulbifera L.</i>                 | Bulbous Water-hemlock          |   |   |   |   |   |   |   |   |   |   | X |   |   |   | X |   |
| <i>Daucus carota L.</i>                    | Wild Carrot, Queen Anne's Lace | + |   |   | X |   |   |   | X | X | X |   |   |   |   |   |   |
| <i>Sanicula gregaria Bickn.</i>            | Black Snakeroot                |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |
| <i>Sium suave Walt.</i>                    | Water-parsnip                  |   |   |   |   |   |   |   |   |   |   | X | X | X |   |   |   |
| <b><u>APOCYNACEAE</u></b>                  | <b><u>DOGBANE FAMILY</u></b>   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Apocynum androsaemifolium L.</i>        | Spreading Dogbane              |   | X |   | X |   |   | X | X | X | X |   |   |   |   |   |   |
| <b><u>ARALIACEAE</u></b>                   | <b><u>GINSENG FAMILY</u></b>   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Aralia nudicaulis L.</i>                | Wild Sarsaparilla              |   | X |   |   |   | X | X | X |   |   |   |   |   |   |   |   |
| <b><u>ARISTOLOCHIACEAE</u></b>             | <b><u>BIRTHWORT FAMILY</u></b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Asarum canadense L.</i>                 | Wild Ginger                    |   |   | X |   |   |   | X |   |   |   |   |   |   |   |   |   |
| <b><u>ASCLEPIADACEAE</u></b>               | <b><u>MILKWEED FAMILY</u></b>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Asclepias incarnata L.</i>              | Swamp Milkweed                 |   |   |   |   |   |   |   |   |   |   | X | X |   | X | X |   |
| <i>Asclepias syriaca L.</i>                | Common Milkweed                |   | X |   | X |   |   |   |   | X | X |   |   |   |   |   |   |
| <b><u>ASTERACEAE</u></b>                   | <b><u>ASTER FAMILY</u></b>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Achillea millefolium L.</i>             | Yarrow                         | + |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |
| <i>Ambrosia artemisiifolia L.</i>          | Common Ragweed                 |   |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |
| <i>Anaphalis margaritacea (L.) Benth.</i>  | Pearly Everlasting             |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |
| <i>Arctium minus (Hill) Bernh.</i>         | Common Burdock                 | + | X | X | X |   | X | X | X | X | X |   |   |   |   | X |   |
| <i>Aster cordifolius L.</i>                | Heart-leaved Aster             |   | X | X |   |   |   |   |   | X |   |   |   |   |   |   |   |
| <i>Aster lanceolatus Willd.</i>            | Tall White Aster               |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Aster lateriflorus (L.) Britt.</i>      | One-sided Aster                |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |
| <i>Aster macrophyllus L.</i>               | Large-leaved Aster             |   | X |   |   |   | X | X | X |   |   |   |   |   |   |   |   |
| <i>Aster novae-angliae L.</i>              | New England Aster              |   |   |   | X | X |   |   |   | X | X |   |   |   |   |   |   |
| <i>Aster puniceus L.</i>                   | Red-stemmed Aster              |   |   |   |   |   |   |   |   | X |   | X | X | X | X | X | X |
| <i>Bidens frondosa L.</i>                  | Devil's Beggarticks            |   |   |   | X |   |   |   | X |   |   | X | X | X | X |   | X |
| <i>Centaurea maculosa Lam.</i>             | Spotted Knapweed               | + |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |
| <i>Chrysanthemum leucanthemum L.</i>       | Ox-eye Daisy                   | + |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |
| <i>Cichorium intybus L.</i>                | Chickory                       | + |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |
| <i>Cirsium arvense (L.) Scop.</i>          | Canada Thistle                 | + |   | X | X | X |   |   |   | X | X |   |   |   |   | X |   |
| <i>Cirsium vulgare (Savi) Tenore</i>       | Bull Thistle                   | + |   |   | X |   |   |   |   | X | X |   |   |   |   |   |   |

|                                                 |                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------------|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <i>Conyza canadensis</i> (L.) Cronq.            | Horse-Weed                        |   |   | x | x | x | x | x | x | x |   |   |   |   |   |   |   |
| <i>Erigeron annuus</i> (L.) Pers.               | Daisy Fleabane                    |   |   | x |   |   |   | x | x | x | x |   |   |   |   |   |   |
| <i>Erigeron philadelphicus</i> L.               | Philadelphia Fleabane             |   |   |   |   | x |   |   |   | x | x |   |   |   |   |   |   |
| <i>Erigeron strigosus</i> L.                    | Daisy Fleabane                    |   |   |   | x |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Eupatorium maculatum</i> L.                  | Spotted Joe-Pye Weed              |   |   |   |   | x |   |   |   |   |   | x |   | x | x | x |   |
| <i>Eupatorium perfoliatum</i> L.                | Boneset                           |   |   |   | x |   |   |   |   |   |   |   |   | x |   |   | x |
| <i>Eupatorium rugosum</i> Houtt.                | White Snakeroot                   |   |   |   |   |   |   | x | x |   |   |   |   |   |   |   |   |
| <i>Euthamia graminifolia</i> (L.) Nutt.         | Narrow-leaf Goldenrod             |   |   |   |   |   |   |   |   |   |   |   |   | x |   |   | x |
| <i>Hieracium aurantiacum</i> L.                 | Orange Hawkweed                   | + |   |   |   |   |   |   |   | x |   |   |   |   |   |   |   |
| <i>Inula helenium</i> L.                        | Elecampane                        | + |   |   |   |   |   |   | x | x |   |   |   | x |   |   | x |
| <i>Matricaria matricarioides</i> (Less.) Porter | Pineapple Weed                    | + |   |   |   |   |   |   |   |   | x |   |   |   |   |   |   |
| <i>Prenanthes altissima</i> L.                  | Tall White Lettuce                |   | x |   |   |   |   | x |   |   |   |   |   |   |   |   |   |
| <i>Rudbeckia hirta</i> L.                       | Black-eyed Susan                  |   |   |   |   |   |   |   |   | x |   |   |   |   |   |   |   |
| <i>Senecio pauperculus</i> Michx.               | Balsam Ragwort                    |   |   |   |   |   |   |   |   | x |   |   |   |   |   |   | x |
| <i>Solidago altissima</i> L.                    | Tall Goldenrod                    |   | x |   | x | x |   | x | x | x | x | x |   |   |   | x | x |
| <i>Solidago canadensis</i> L.                   | Canada Goldenrod                  |   | x | x | x | x | x | x | x | x | x | x |   |   |   | x | x |
| <i>Solidago ohioensis</i> Riddell               | Ohio Goldenrod                    |   |   |   |   |   |   |   |   |   |   |   | x |   |   |   |   |
| <i>Solidago rugosa</i> Ait.                     | Rough Goldenrod                   |   |   |   |   |   |   |   | x | x |   |   |   |   |   |   |   |
| <i>Sonchus arvensis</i> L.                      | Field Sow-thistle                 | + | x |   | x | x |   |   | x | x | x |   |   |   |   |   |   |
| <i>Taraxacum officinale</i> Weber               | Dandelion                         | + | x | x | x | x | x | x | x | x | x |   |   |   |   |   | x |
| <i>Tragopogon pratensis</i> L.                  | Meadow Goat's-beard               | + |   |   |   |   |   |   |   | x |   |   |   |   |   |   |   |
| <i>Tussilago farfara</i> L.                     | Coltsfoot                         | + |   |   | x |   |   |   | x |   |   | x |   |   |   | x | x |
| <b><u>BALSAMINACEAE</u></b>                     | <b><u>TOUCH-ME-NOT-FAMILY</u></b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Impatiens capensis</i> Meerb.                | Spotted Jewelweed                 |   |   | x | x |   |   |   | x |   |   | x |   | x | x |   | x |
| <b><u>BERBERIDACEAE</u></b>                     | <b><u>BARBERRY FAMILY</u></b>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Berberis vulgaris</i> L.                     | Common Barberry                   | + |   |   |   |   |   |   | x |   |   |   |   |   |   |   |   |
| <b><u>BETULACEAE</u></b>                        | <b><u>BIRCH FAMILY</u></b>        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Betula alleghaniensis</i> Britt.             | Yellow Birch                      |   |   |   |   |   |   |   | x |   |   | x | x | x |   |   |   |
| <i>Betula papyrifera</i> Marsh.                 | Paper Birch                       |   | x | x | x |   |   | x | x | x | x |   |   | x | x |   | x |
| <i>Corylus cornuta</i> Marsh.                   | Beaked Hazelnut                   |   | x |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Ostrya virginiana</i> (Mill.) K. Koch        | Hop Hornbeam                      |   | x |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <b><u>BORAGINACEAE</u></b>                      | <b><u>BORAGE FAMILY</u></b>       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Cynoglossum officinale</i> L.                | Hound's-tongue                    | + |   |   | x |   |   |   | x |   |   |   |   |   |   |   |   |
| <i>Lithospermum arvense</i>                     | Corn Gromwell                     | + |   |   |   |   |   |   | x |   | x |   |   |   |   |   |   |
| <i>Myosotis scorpioides</i> L.                  | True Forget-me-not                | + |   | x | x | x |   |   |   |   |   | x | x | x | x | x | x |
| <b><u>BRASSICACEAE</u></b>                      | <b><u>MUSTARD FAMILY</u></b>      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Barbarea vulgaris</i> R. Br.                 | Yellow Rocket                     | + |   | x | x | x |   |   | x |   |   | x | x | x | x | x | x |
| <i>Cardamine diphylla</i> (Michx.) Alph. Wood   | Toothwort                         |   | x |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Erysimum cheiranthoides</i> L.               | Wormseed Mustard                  | + |   |   |   |   |   |   | x | x | x |   |   |   |   |   |   |
| <i>Hesperis matronalis</i> L.                   | Dame's-rocket                     | + |   |   | x |   |   |   |   | x |   |   |   |   |   |   |   |
| <i>Lepidium densiflorum</i> Schrad.             | Common Pepper-grass               | + |   |   |   |   |   |   |   |   | x |   |   |   |   |   |   |
| <i>Sisymbrium altissimum</i> L.                 | Tumble Mustard                    | + |   |   | x |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Thlaspi arvense</i> L.                       | Penny Cress                       | + |   |   |   |   |   |   |   |   | x |   |   |   |   |   |   |
| <b><u>CAPRIFOLIACEAE</u></b>                    | <b><u>HONEYSUCKLE FAMILY</u></b>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Diervilla lonicera</i> Mill.                 | Bush-honeysuckle                  |   | x |   |   |   |   | x | x |   |   |   | x | x | x |   |   |
| <i>Lonicera tatarica</i> L.                     | Tartarian Honeysuckle             | + | x |   |   | x |   |   | x | x | x |   |   |   |   |   |   |
| <i>Sambucus canadensis</i> L.                   | Common Elder                      |   | x | x |   |   |   | x | x | x |   | x |   |   | x | x |   |
| <i>Sambucus racemosa</i> L.                     | Red-berried Elder                 |   |   |   | x |   |   |   |   |   |   | x | x | x | x |   |   |
| <i>Viburnum acerifolium</i> L.                  | Maple-leaved Viburnum             |   | x |   | x | x |   |   | x | x |   | x | x | x | x |   | x |
| <i>Viburnum opulus</i> L.                       | Guelder Rose                      | + |   |   |   |   |   |   | x | x | x |   |   |   |   |   |   |
|                                                 |                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

|                                                 |                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------------|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b><u>CARYOPHYLLACEAE</u></b>                   | <b><u>PINK FAMILY</u></b>            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Cerastium arvense</i>                        | Field Chickweed                      |   |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |
| <i>Saponaria officinalis L.</i>                 | Bouncing-bet                         | + |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |
| <i>Silene vulgaris (Moench) Garcke</i>          | Bladder Campion                      | + | X | X |   |   | X | X | X | X | X |   |   |   |   |   |   |   |
| <i>Stellaria graminea L.</i>                    | Grass-leaved Stitchwort              | + |   |   | X |   |   |   | X | X | X |   |   |   |   |   |   |   |
| <b><u>CELASTRACEAE</u></b>                      | <b><u>STAFF-TREE FAMILY</u></b>      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Celastrus scandens L.</i>                    | Climbing Bittersweet                 |   |   |   |   |   |   | X |   |   |   | X |   |   |   |   |   |   |
| <b><u>CHENOPODIACEAE</u></b>                    | <b><u>SPINACH FAMILY</u></b>         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Chenopodium album L.</i>                     | Lamb's-quarters                      | + |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |
| <b><u>CONVOLVULACEAE</u></b>                    | <b><u>MORNING GLORY FAMILY</u></b>   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Convolvulus arvensis L.</i>                  | Field Bindweed                       | + |   |   | X |   |   |   |   | X | X |   |   |   |   |   |   |   |
| <b><u>CORNACEAE</u></b>                         | <b><u>DOGWOOD FAMILY</u></b>         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Cornus alternifolia L.f.</i>                 | Alternate-leaved Dogwood             |   | X | X | X | X | X | X | X | X |   | X | X | X | X | X | X | X |
| <i>Cornus canadensis L.</i>                     | Bunchberry                           |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |
| <i>Cornus rugosa Lam.</i>                       | Round-leaved Dogwood                 |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |
| <i>Cornus stolonifera Michx.</i>                | Red-osier Dogwood                    |   | X | X | X | X |   | X | X |   |   | X | X | X | X | X | X | X |
| <b><u>CUCURBITACEAE</u></b>                     | <b><u>GOURD FAMILY</u></b>           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Echinocystis lobata (Michx.) T. &amp; G.</i> | Wild Cucumber                        |   |   |   | X |   |   |   | X |   |   | X |   |   | X |   | X |   |
| <b><u>DIPSACACEAE</u></b>                       | <b><u>TEASEL FAMILY</u></b>          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Dipsacus fullonum L.</i>                     | Teasel                               | + |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |
| <b><u>ELAEAGNACEAE</u></b>                      | <b><u>OLEASTER FAMILY</u></b>        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Shepherdia canadensis (L.) Nutt.</i>         | Soapberry, Buffaloberry              |   | X |   |   |   |   | X |   | X |   |   |   |   |   |   |   |   |
| <b><u>FAGACEAE</u></b>                          | <b><u>BEECH FAMILY</u></b>           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Fagus grandifolia Ehrh.</i>                  | American Beech                       |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |
| <i>Quercus rubra L.</i>                         | Red Oak                              |   | X |   |   | X |   | X |   |   |   |   |   |   |   |   |   |   |
| <b><u>FABACEAE</u></b>                          | <b><u>PEA FAMILY</u></b>             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Amphicarpaea bracteata (L.) Fern.</i>        | Hog-peanut                           |   |   | X | X | X |   |   | X |   |   | X | X | X |   |   | X | X |
| <i>Desmodium canadense (L.) DC.</i>             | Showy Tick-trefoil                   |   | X |   |   |   |   | X | X | X |   |   |   |   |   |   |   |   |
| <i>Lathyrus palustris L.</i>                    | Marsh Pea                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |
| <i>Medicago lupulina L.</i>                     | Black Medic                          | + |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |
| <i>Melilotus alba Medic.</i>                    | White Sweet-clover                   | + | X |   | X |   |   |   | X | X |   |   |   |   |   |   |   |   |
| <i>Trifolium campestre Schreb.</i>              | Low Hop Clover                       | + |   |   |   |   |   |   | X | X | X |   |   |   |   |   |   |   |
| <i>Trifolium pratense L.</i>                    | Red Clover                           | + |   | X |   |   |   |   | X | X | X |   |   |   |   |   |   |   |
| <i>Trifolium procumbens L.</i>                  | Low Hop-Clover                       | + |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Trifolium repens L.</i>                      | White Clover                         | + |   |   |   |   |   |   | X | X | X |   |   |   |   |   |   |   |
| <i>Vicia cracca L.</i>                          | Bird Vetch                           | + |   | X | X | X |   |   | X | X | X | X |   |   |   |   | X | X |
| <b><u>GERANIACEAE</u></b>                       | <b><u>GERANIUM FAMILY</u></b>        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Geranium robertianum L.</i>                  | Herb Robert                          | + |   | X |   | X | X | X | X |   |   |   |   |   | X |   |   |   |
| <b><u>GROSSULARIACEAE</u></b>                   | <b><u>GOOSEBERRY FAMILY</u></b>      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Ribes americanum Mill.</i>                   | Wild Black Currant                   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |
| <i>Ribes cynosbati L.</i>                       | Prickly Gooseberry                   |   | X |   | X |   |   | X |   |   |   |   |   |   |   |   |   |   |
| <i>Ribes rubrum L.</i>                          | Red Currant                          | + |   |   |   |   | X |   |   |   |   | X |   | X |   |   |   |   |
| <b><u>HYDROPHYLLACEAE</u></b>                   | <b><u>WATERLEAF FAMILY</u></b>       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Hydrophyllum virginianum L.</i>              | Virginia Waterleaf                   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |
| <b><u>HYPERICACEAE</u></b>                      | <b><u>ST. JOHN'S-WORT FAMILY</u></b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Hypericum perforatum L.</i>                  | Common St. John's-wort               | + | X | X | X | X | X | X | X | X | X |   |   |   |   |   |   | X |
| <i>Triadenum fraseri (Spach) Gl.</i>            | Marsh St. John's-wort                |   |   |   |   |   |   |   |   |   |   |   | X | X |   | X |   |   |
| <b><u>LAMIACEAE</u></b>                         | <b><u>MINT FAMILY</u></b>            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Galeopsis tetrahit L.</i>                    | Hemp-nettle                          | + |   |   |   |   |   |   |   |   |   | X |   | X |   |   |   |   |
| <i>Leonurus cardiaca L.</i>                     | Motherwort                           | + | X |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |
| <i>Lycopus americanus Muhl.</i>                 | American Water-horehound             |   |   |   | X |   |   |   |   |   |   | X | X |   | X | X | X |   |

|                                              |                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------------------------------|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <i>Mentha arvensis</i> L.                    | Field or Common Mint                  |   |   |   | x |   |   |   | x | x |   | x | x | x | x |   | x | x |
| <i>Monarda fistulosa</i> L.                  | Wild Bergamot                         |   | x |   |   |   |   |   |   | x |   |   |   |   |   |   |   |   |
| <i>Nepeta cataria</i> L.                     | Catnip                                | + |   | x |   |   |   |   |   |   | x |   |   |   |   |   |   |   |
| <i>Prunella vulgaris</i> L.                  | Heal-all                              | + |   | x | x |   |   | x | x | x | x |   |   |   |   |   |   |   |
| <i>Satureja vulgaris</i> (L.) Fritsch        | Wild Basil                            |   | x |   | x | x | x | x | x | x | x |   |   |   |   |   |   |   |
| <b><u>LYTHRACEAE</u></b>                     | <b><u>LOOSESTRIFE FAMILY</u></b>      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Lythrum salicaria</i> L.                  | Purple Loosestrife                    | + |   |   | x |   |   |   |   |   |   | x | x | x |   |   | x | x |
| <b><u>MALVACEAE</u></b>                      | <b><u>MALLOW FAMILY</u></b>           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Malva neglecta</i> Wallr.                 | Common Mallow                         | + |   | x |   | x | x | x | x |   |   |   |   |   | x |   |   |   |
| <b><u>OLEACEAE</u></b>                       | <b><u>OLIVE FAMILY</u></b>            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Fraxinus americana</i> L.                 | White Ash                             |   | x | x |   |   |   | x | x | x |   |   |   |   |   |   |   |   |
| <i>Fraxinus nigra</i> Marsh.                 | Black Ash                             |   |   |   |   |   |   |   |   |   |   | x | x | x | x | x |   |   |
| <i>Fraxinus pennsylvanica</i> Marsh.         | Green Ash                             |   | x | x | x | x |   | x | x | x |   |   | x | x | x | x | x | x |
| <b><u>ONAGRACEAE</u></b>                     | <b><u>EVENING-PRIMROSE FAMILY</u></b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Circaea lutetiana</i> L.                  | Enchanter's Nightshade                |   | x | x | x | x | x | x | x |   |   | x | x |   | x |   |   |   |
| <i>Epilobium hirsutum</i> L.                 | Hairy Willowherb                      | + |   |   | x |   |   |   |   |   |   | x |   | x |   |   | x |   |
| <i>Epilobium parviflorum</i> Schreb.         | Small-flowered Willowherb             | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   | x | x |
| <i>Oenothera biennis</i> L.                  | Hairy Yellow Evening-primrose         |   |   |   |   |   |   |   |   | x |   |   |   |   |   |   |   |   |
| <b><u>OXALIDACEAE</u></b>                    | <b><u>WOOD-SORREL FAMILY</u></b>      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Oxalis stricta</i> L.                     | Common Yellow Wood-sorrel             | + | x | x | x | x | x | x | x |   |   |   |   |   | x |   |   |   |
| <b><u>PHRYMACEAE</u></b>                     | <b><u>LOPSEED FAMILY</u></b>          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Phryma leptostachya</i> L.                | Lopseed                               |   |   |   |   |   |   | x |   |   |   |   |   |   |   |   |   |   |
| <b><u>PLANTAGINACEAE</u></b>                 | <b><u>PLANTAIN FAMILY</u></b>         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Plantago lanceolata</i> L.                | English Plantain                      | + |   |   |   |   |   | x | x | x | x |   |   |   |   |   |   |   |
| <i>Plantago major</i> L.                     | Broad-leaved Plantain                 | + |   |   |   |   |   |   |   | x | x |   |   |   |   |   |   |   |
| <b><u>POLYGONACEAE</u></b>                   | <b><u>BUCKWHEAT FAMILY</u></b>        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Polygonum hydropiper</i> L.               | Marshpepper Smartweed                 |   |   |   | x |   |   |   |   |   |   | x |   | x | x |   |   |   |
| <i>Polygonum hydropiperoides</i> Michx.      | Mild Waterpepper                      |   |   |   |   |   |   |   |   |   |   |   | x |   |   |   |   |   |
| <i>Polygonum persicaria</i> L.               | Lady's Thumb                          | + |   |   |   |   |   |   | x |   |   |   |   |   |   |   |   |   |
| <i>Polygonum scandens</i> L.                 | Climbing False Buckwheat              |   | x |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Rumex acetosella</i> L.                   | Sheep Sorrel                          | + |   |   |   |   |   |   |   | x | x |   |   |   |   |   |   |   |
| <i>Rumex crispus</i> L.                      | Curly Dock                            | + |   |   |   |   |   |   | x | x | x |   |   |   |   |   |   |   |
| <i>Rumex obtusifolius</i> L.                 | Bitter Dock                           | + |   |   | x | x |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Rumex orbiculatus</i> Gray                | Great Water Dock                      |   |   |   |   |   |   |   |   |   |   |   | x | x |   |   |   |   |
| <i>Rumex verticillatus</i> L.                | Water Dock                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   | x |   |   |
| <b><u>PRIMULACEAE</u></b>                    | <b><u>PRIMROSE FAMILY</u></b>         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Lysimachia ciliata</i> L.                 | Fringed Loosestrife                   |   | x | x | x | x |   |   | x |   |   | x | x | x | x |   | x | x |
| <i>Lysimachia nummularia</i> L.              | Moneywort                             | + |   |   |   | x | x | x |   |   |   |   |   |   |   | x |   |   |
| <i>Trientalis borealis</i> Raf.              | Star-flower                           |   |   |   |   |   | x | x | x |   |   |   |   |   | x |   |   |   |
| <b><u>PYROLACEAE</u></b>                     | <b><u>WINTERGREEN FAMILY</u></b>      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Pyrola elliptica</i> Nutt.                | Shinleaf                              |   | x |   |   |   |   | x |   |   |   |   |   |   |   |   |   |   |
| <b><u>RANUNCULACEAE</u></b>                  | <b><u>BUTTERCUP FAMILY</u></b>        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Actaea pachypoda</i> Ell.                 | White Baneberry                       |   | x |   |   |   |   | x |   |   |   |   |   |   |   |   |   |   |
| <i>Actaea rubra</i> (Ait.) Willd.            | Red Baneberry                         |   |   | x |   |   | x | x | x |   |   |   |   |   |   |   |   |   |
| <i>Anemone canadensis</i> L.                 | Canada Anemone                        |   | x | x |   | x |   |   |   | x | x |   |   |   |   |   |   |   |
| <i>Anemone virginiana</i> L.                 | Thimbleweed                           |   | x |   | x |   |   |   | x |   |   |   |   |   |   |   |   |   |
| <i>Caltha palustris</i> L.                   | Marsh-marigold                        |   |   |   |   |   |   |   |   |   |   |   | x | x |   |   |   |   |
| <i>Clematis virginiana</i> L.                | Virgin's-bower                        |   | x |   |   |   |   |   |   | x |   |   | x |   | x |   | x |   |
| <i>Ranunculus acris</i> L.                   | Tall Buttercup                        | + | x | x | x | x |   | x | x |   |   |   |   |   | x |   | x | x |
| <i>Ranunculus fascicularis</i> Muhl. ex Big. | Early Buttercup                       |   |   |   |   |   |   |   |   | x | x |   |   |   |   |   |   |   |
| <i>Ranunculus hispidus</i> Michx.            | Swamp Buttercup                       |   |   |   |   |   |   |   |   |   |   |   | x |   |   |   |   |   |

|                                     |                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <i>Ranunculus repens</i> L.         | Creeping Buttercup              | + | x | x | x | x | x | x | x | x |   | x |   | x | x | x | x |
| <i>Thalictrum dioicum</i> L.        | Early Meadow Rue                |   | x |   | x | x | x | x | x | x |   | x | x | x | x | x | x |
| <i>Thalictrum pubescens</i> Pursh   | Tall Meadow Rue                 |   | x | x | x | x | x | x | x | x |   | x | x | x | x | x | x |
| <b><u>RHAMNACEAE</u></b>            | <b><u>BUCKTHORN FAMILY</u></b>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Rhamnus cathartica</i> L.        | Common Buckthorn                | + | x | x | x | x | x | x | x |   |   |   |   | x |   |   |   |
| <b><u>ROSACEAE</u></b>              | <b><u>ROSE FAMILY</u></b>       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Agrimonia gryposepala</i> Wallr. | Agrimony                        |   |   |   | x |   |   |   |   | x |   |   |   |   |   |   |   |
| <i>Crataegus</i> sp.                | Hawthorn sp.                    |   |   |   | x | x |   |   | x |   |   |   |   |   |   |   |   |
| <i>Fragaria vesca</i> L.            | Woodland Strawberry             |   |   |   |   |   |   |   |   |   |   |   |   | x |   |   |   |
| <i>Fragaria virginiana</i> Dcne.    | Common Strawberry               |   |   |   |   | x |   |   |   | x | x |   |   |   |   |   |   |
| <i>Geum aleppicum</i> Jacq.         | Yellow Avens                    |   | x | x |   | x | x | x |   |   |   |   |   |   |   |   |   |
| <i>Geum canadense</i> Jacq.         | White Avens                     |   |   | x | x |   |   | x |   |   |   |   |   |   |   |   |   |
| <i>Malus pumila</i> Miller          | Apple                           |   |   |   |   |   |   |   | x | x |   |   |   |   |   |   |   |
| <i>Potentilla recta</i> L.          | Rough-fruited Cinquefoil        | + |   |   |   |   |   |   |   | x |   |   |   |   |   |   |   |
| <i>Prunus serotina</i> Ehrh.        | Black Cherry                    |   | x |   |   |   |   | x |   |   |   |   |   |   |   |   |   |
| <i>Prunus virginiana</i> L.         | Choke Cherry                    |   | x |   |   |   | x | x | x | x |   |   |   |   |   |   |   |
| <i>Rosa multiflora</i> Thumb.       | Multiflora Rose                 | + | x |   |   |   |   |   | x | x |   |   |   |   |   |   |   |
| <i>Rubus allegheniensis</i> Porter  | Common Blackberry               |   |   |   |   |   |   |   | x |   |   | x |   | x |   |   |   |
| <i>Rubus flagellaris</i> L.         | Northern Dewberry               |   |   |   |   |   |   |   |   |   |   |   |   | x |   |   |   |
| <i>Rubus idaeus</i> L.              | Wild Red Raspberry              |   | x | x | x | x |   | x | x | x |   |   |   |   |   |   |   |
| <i>Rubus occidentalis</i> L.        | Black Raspberry                 |   | x |   | x |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Rubus pubescens</i> Raf.         | Dwarf Raspberry                 |   | x |   |   |   |   |   |   |   |   |   | x |   | x | x |   |
| <i>Sorbus americana</i> Marsh.      | American Mountain-ash           |   |   |   |   |   |   | x |   |   |   |   |   |   |   |   |   |
| <i>Spiraea alba</i> DuRoi           | Meadowsweet                     |   |   |   | x |   |   |   | x | x |   | x |   | x | x | x | x |
| <b><u>RUBIACEAE</u></b>             | <b><u>MADDER FAMILY</u></b>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Galium aparine</i> L.            | Cleavers                        |   |   |   | x |   |   |   |   |   |   | x | x | x | x |   |   |
| <i>Galium palustre</i> L.           | Marsh Bedstraw                  |   |   |   |   |   |   |   |   |   |   |   | x | x | x | x | x |
| <i>Galium triflorum</i> Michx.      | Sweet-scented Bedstraw          |   |   | x | x | x |   |   | x |   |   | x |   | x |   | x | x |
| <i>Mitchella repens</i> L.          | Partridge berry                 |   |   |   |   |   |   | x |   |   |   |   |   |   |   |   |   |
| <b><u>SALICACEAE</u></b>            | <b><u>WILLOW FAMILY</u></b>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Populus balsamifera</i> L.       | Balsam Poplar                   |   | x |   | x | x |   | x | x | x |   | x | x | x | x |   |   |
| <i>Populus deltoides</i> Marsh      | Cottonwood                      |   |   |   |   |   |   |   |   |   |   |   |   | x | x |   |   |
| <i>Populus grandidentata</i> Michx. | Large-toothed Aspen             |   | x |   |   |   |   | x | x | x |   |   |   | x | x |   | x |
| <i>Populus tremuloides</i> Michx.   | Trembling Aspen                 |   | x | x | x | x | x | x | x | x |   | x | x | x | x | x | x |
| <i>Salix alba</i> L.                | White Willow                    | + |   |   | x |   |   |   | x |   |   | x |   | x |   | x | x |
| <i>Salix discolor</i> Muhl.         | Pussy Willow                    |   |   |   |   | x |   |   |   |   |   |   | x | x | x | x |   |
| <i>Salix eriocephala</i> Michx.     | Heart-leaved Willow             |   |   |   |   |   |   |   |   |   |   |   |   | x |   |   |   |
| <i>Salix fragilis</i> L.            | Crack Willow                    | + |   |   | x |   |   |   |   |   |   | x |   |   |   | x |   |
| <i>Salix</i> sp.                    | Willow                          |   |   |   | x |   |   |   |   |   |   |   | x |   |   |   |   |
| <i>Salix x rubens</i> Schrank.      | Hybrid Crack Willow             | + |   |   | x |   |   |   |   |   |   | x |   |   |   | x |   |
| <b><u>SAXIFRAGACEAE</u></b>         | <b><u>SAXIFRAGE FAMILY</u></b>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Tiarella cordifolia</i> L.       | Foam Flower                     |   |   |   |   |   |   |   |   |   |   |   | x |   | x | x |   |
| <b><u>SCROPHULARIACEAE</u></b>      | <b><u>FIGWORT FAMILY</u></b>    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Chelone glabra</i> L.            | Turtlehead                      |   |   |   |   |   |   | x |   |   |   |   | x | x | x |   |   |
| <i>Linaria vulgaris</i> Mill.       | Butter-and-eggs                 | + |   |   |   |   |   |   |   | x | x |   |   |   |   |   |   |
| <i>Pedicularis canadensis</i> L.    | Wood-betony                     |   |   |   |   |   |   | x |   |   |   |   |   |   |   |   |   |
| <i>Verbascum thapsus</i> L.         | Common Mullein                  | + |   |   |   |   |   |   | x | x |   |   |   |   |   |   |   |
| <i>Veronica officinalis</i> L.      | Common Speedwell                | + |   |   |   |   | x | x |   |   |   |   |   |   |   |   |   |
| <i>Veronica serpyllifolia</i> L.    | Thyme-leaved Speedwell          | + | x | x |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <b><u>SOLANACEAE</u></b>            | <b><u>NIGHTSHADE FAMILY</u></b> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Solanum dulcamara</i> L.         | Bittersweet Nightshade          | + | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

|                                                       |                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------------------|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <u><b>TILIACEAE</b></u>                               | <u><b>LINDEN FAMILY</b></u>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Tilia americana</i> L.                             | Basswood                     |   | x |   | x | x |   | x |   |   |   |   |   |   | x |   |   |
| <u><b>ULMACEAE</b></u>                                | <u><b>ELM FAMILY</b></u>     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Ulmus americana</i> L.                             | American Elm                 |   | x | x | x | x | x | x | x | x |   | x | x | x | x | x | x |
| <i>Ulmus pumila</i> L.                                | Siberian Elm                 | + |   |   |   |   |   |   |   |   | x |   |   |   |   |   |   |
| <u><b>URTICACEAE</b></u>                              | <u><b>NETTLE FAMILY</b></u>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Laportea canadensis</i> (L.) Wedd.                 | Wood Nettle                  |   |   |   | x |   |   |   |   |   |   | x |   |   |   |   |   |
| <i>Pilea pumila</i> (L.) Gray                         | Clearweed                    |   |   |   | x |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Urtica dioica</i> L. subsp. <i>gracilis</i> (Ait.) | American Stinging Nettle     |   |   |   | x |   |   |   | x | x |   |   |   |   |   | x |   |
| <u><b>VERBENACEAE</b></u>                             | <u><b>VERVAIN FAMILY</b></u> |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Verbena hastata</i> L.                             | Blue Vervain                 |   |   |   | x |   |   |   |   |   |   |   |   |   |   | x | x |
| <u><b>VIOLACEAE</b></u>                               | <u><b>VIOLET FAMILY</b></u>  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Viola canadensis</i> L.                            | Canada Violet                |   |   |   |   |   |   |   |   | x |   |   |   |   |   |   |   |
| <i>Viola cucullata</i> Ait.                           | Marsh Violet                 |   |   |   | x |   |   |   |   |   |   | x | x | x | x | x | x |
| <i>Viola pubescens</i> Ait.                           | Downy Yellow Violet          |   | x |   |   |   |   | x |   |   |   |   |   |   |   |   |   |
| <i>Viola sororia</i> Willd.                           | Common Blue Violet           |   |   |   | x |   |   |   | x | x |   |   |   |   |   |   |   |
| <u><b>VITACEAE</b></u>                                | <u><b>GRAPE FAMILY</b></u>   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| <i>Parthenocissus inserta</i> (A. Kerner) Fritsch     | Virginia Creeper             |   | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| <i>Vitis riparia</i> Michx.                           | Riverbank Grape              |   | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
|                                                       |                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

+ - Non-native species



# APPENDIX D

## Photographs of ELC Units





**Photograph 1.** View of upland poplar deciduous woods (FODM3-1) on ridge, dominated by trembling aspen, largetooth aspen and white birch, with woody associates of white ash, basswood, red oak and scattered sugar maple, situated north of wetland unit C (SWDM3-1)



**Photograph 2.** View inside a portion of upland poplar deciduous woods (FODM3-1), showing early successional growth of trembling aspen and white birch, with weedy/grass groundcover, situated along southern edge of wetland unit B (SWDM3-1)



**Photograph 3.** Inside view of upland early successional poplar woods (FODM3-1) in southeast corner (July 26 2019), clear cut after 2012, showing regeneration of trembling aspen seedlings and saplings, with a dense ground cover of white sweet-clover and adventive weeds



**Photograph 4.** General view inside portion of lowland green ash-white elm woods (FODM7-2), with dogwood and buckthorn shrub stratum, and weedy groundcover, extensively grazed in past by cattle





**Photograph 5.** View of eastern edge of lowland green ash-white woods that borders east side of Silver Creek, groundcover dominated by enchanters nightshade, herb-robert, common buttercup, dandelion and yellow avens



**Photograph 6.** Copse of lowland willow woods (FODM7-3) that borders both sides of Silver Creek and extends into floodplain, contains crack willow, hybrid willow, green ash, white elm and Manitoba maple, with grass/fern groundcover



**Photograph 7.** View upgradient along edge of Silver Creek, that is bordered by copse of lowland willow woods (FODM7-3), with ostrich fern, reed canary grass, Canada anemone, coltsfoot, nettle and common burdock in groundcover



**Photograph 8.** View of naturalized deciduous hedge-row (FODM11), situated along southern property fenceline, dominated by green ash, white elm, trembling aspen, red-osier dogwood with grass/herbaceous forb groundflora





**Photograph 9.** View inside portion of upland white cedar coniferous woods (FOCM2-2), dominated by eastern white cedar, with scattered associates such as trembling aspen and white birch, groundcover of herb-robert, spinulose wood-fern, poison ivy, common strawberry, bulblet fern and helleborine



**Photograph 10.** Typical composition and distribution of eastern white cedar within upland conifer woods (FOCM2-2), along with scattered poplars, white birch and white ash, with moss and weedy groundflora



**Photograph 11.** Upland white cedar-hardwood mixed woods (FOMM4-3), dominated by eastern white cedar, along with associates of trembling aspen, white birch, balsam poplar, white elm and white ash



**Photograph 12.** Western edge of large block of upland white cedar-hardwood mixed woods (FOMM4-3), showing natural regeneration of eastern white cedar, green ash and trembling aspen





**Photograph 13.** View inside portion of lowland poplar-green ash woodland (WODM5-1), with associates of white elm, balsam poplar, willows and white ash on west side of Silver Creek (July 26 2019), grazed in the past by cattle and selectively cut after 2012, partially grazed by cattle in 2019



**Photograph 14.** Copse of lowland poplar-green ash woodland (WODM5-1), grazed in past by cattle as evidenced by lack of understory and shrub stratum, with a groundcover of grasses, weeds and herbaceous forbs on east side of Silver Creek



**Photograph 15.** Westward view of a portion of goldenrod forb meadow (MEFM1-1), dominated by tall goldenrod, Canada goldenrod, wild carrot, red clover, New England aster, hairy agrimony, timothy, orchard grass, meadow fescue, common buttercup, spreading dogbane and eastern bracken fern



**Photograph 16.** View of block of goldenrod forb meadow (MEFM1-1) at southern end of property, with groundcover comprised of grasses, forbs and weeds, with encroachment of eastern white cedar, buckthorn and dogwoods





**Photograph 17.** View of an opening (MEFM1-1) within upland ridge of poplar-birch woods (FODM3-1), sandy soils support eastern bracken fern, poison ivy, showy tick-trefoil, common buttercup, wild carrot and common strawberry



**Photograph 18.** View of large block of open graminoid meadow (MEFM4), on west side of Silver Creek, remnant agricultural pastureland, with groundcover dominated by timothy, blue grass, meadow fescue and orchard grass, along with Canada thistle, field horsetail, common buttercup, goldenrods and asters



**Photograph 19.** View of large block of open graminoid meadow (MEFM4), on east side of Silver Creek, dominated by timothy, orchard grass, meadow fescue, common buttercup, wild carrot, goldenrods, asters, thistles and field horsetail



**Photograph 20.** Inside view of green ash deciduous swamp (SWDM2-2), part of Silver Creek Wetland Complex, dominated by green ash and white elm, along with willows, trembling aspen, dogwoods, and groundcover of Virginia creeper, sedges, grasses and ferns





**Photograph 21.** Down-gradient view of intermittent drainage swale (non-fish bearing), with portion of green ash-white elm deciduous swamp stand (SWDM2-2), part of Silver Creek Wetland Complex



**Photograph 22.** Inside view of red maple-green ash deciduous swamp (SWDM3-1), lies within lowland trough between shallow upland ridges, contains standing water during most of growing season, with drier sections dominated by sensitive fern, marsh fern, sedges, water parsnip, ostrich fern and bedstraws



**Photograph 23.** View inside another unit of red maple-green ash deciduous swamp (SWDM3-1), situated in low-lying east-west trough, showing standing stagnant water, with wet-saturated muck edge soils vegetated with ferns, sedges and aquatic forbs



**Photograph 24.** View of standing stagnant water within low-lying trough of red maple-green ash treed swamp (SWDM3-1), with associates of black ash, yellow birch, balsam poplar, white elm, dogwoods and scattered eastern white cedar





**Photograph 25.** View inside moist-wet portion of red maple-green ash treed swamp (SWDM3-1), with groundcover of marsh fern, sensitive fern, interior sedge, crested fern, meadowrue, ostrich fern, bedstraw and fringed loosestrife



**Photograph 26.** View of stand of poplar deciduous swamp (SWDM4-5), part of Silver Creek Wetland Complex, dominated by trembling aspen, balsam poplar, white birch, green ash, white elm, dogwoods and meadowsweet



**Photograph 27.** Poplar treed swamp (SWDM4-5) dominated by trembling aspen, balsam poplar, white birch, green ash, black ash, dogwoods and white elm, with groundflora of grasses, sedges and ferns



**Photograph 28.** Narrow low-lying trough of poplar-conifer mixed swamp (SWMM3-2), dominated by trembling aspen, large-tooth aspen and eastern white cedar, with groundflora of fringed loosestrife, sensitive fern, blue flag, Jack-in-the-pulpit, water horehound, mosses, wild mint and dwarf raspberry





**Photograph 29.** View inside portion of poplar-conifer mixed swamp (SWMM3-2), comprised of trembling aspen, large-toothed aspen and eastern white cedar, with shrub stratum of dogwoods and white elm and a groundcover of sedges, ferns and aquatic forbs



**Photograph 30.** View of a small pocket of red-oiser dogwood deciduous thicket swamp (SWTM2-1), along with alternate-leaved dogwood, riverbank grape and willows and standing stagnant water, an inclusion with trough of red maple-green ash treed swamp (SWDM3-1)



**Photograph 31.** Narrow bands of reed-canary grass graminoid meadow marsh (MAMM1-3), along edges of Silver Creek, also contains ostrich fern, Canada anemone, coltsfoot, Canada bluejoint grass, spotted Joe pye-weed and vetch



**Photograph 32.** View of a pocket of rush graminoid meadow marsh (MAMM1-13), dominated by jointed rush, along with awl-fruited sedge, meadow sedge, riverbank grape, green ash seedlings, reed-canary grass and bedstraws



# APPENDIX E

## Breeding Birds Observed on the Subject Lands



### Observation session

| Area Sensitive Species |       |      |
|------------------------|-------|------|
| Forest                 | Marsh | Open |
| 28                     | 1     |      |
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|                        |       | a    |

\* indicates a non-breeder  
\*\* indicates a migrator  
X indicates observed only

|                           |    |
|---------------------------|----|
| Number of Species:        | 79 |
| Federal SAR (COSEWIC):    | 0  |
| Provincial SAR (COSARRO): | 0  |
| NHIC S-rank species:      | 0  |
| Regionally rare species:  | 0  |
| Area Sensitive Species:   | 37 |

Appendix E. Bird Species List, Huntingwood (Collingwood), 2019

|               |                                  |                          | Point Count Station |        |        |        |                |        |        |        |        |        |        |        |        |        |
|---------------|----------------------------------|--------------------------|---------------------|--------|--------|--------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|               |                                  |                          | 1                   |        | 2      |        | 3              |        | 4      |        | 5      |        | 6      |        | 7      |        |
| FAMILY        | SCIENTIFIC NAME                  | COMMON NAME              | 11-Jun              | 27-Jun | 11-Jun | 27-Jun | 11-Jun         | 27-Jun | 11-Jun | 27-Jun | 11-Jun | 27-Jun | 11-Jun | 27-Jun | 11-Jun | 27-Jun |
| Anatidae      | <i>Branta canadensis</i>         | Canada Goose             |                     |        |        |        | H <sup>1</sup> |        |        |        |        |        |        |        |        |        |
| Bombycillidae | <i>Bombycilla cedrorum</i>       | Cedar Waxwing            |                     |        |        | V      |                |        |        |        |        |        |        | V      |        |        |
| Cardinalidae  | <i>Cardinalis cardinalis</i>     | Northern Cardinal        | V                   |        |        |        |                |        |        | V      |        |        |        | V      |        |        |
| Certhiidae    | <i>Certhia americana</i>         | Brown Creeper            | S                   |        |        | S      |                |        |        |        |        |        |        |        |        |        |
| Corvidae      | <i>Corvus brachyrhynchos</i>     | American Crow            |                     |        | V      | V      |                |        |        | V      |        |        |        |        |        | V      |
| Corvidae      | <i>Cyanocitta cristata</i>       | Blue Jay                 |                     |        |        | V      |                |        |        |        |        |        |        |        | V      | V      |
| Cuculidae     | <i>Coccyzus erythrophthalmus</i> | Black-billed Cuckoo      |                     |        |        |        |                |        |        |        |        |        |        |        |        |        |
| Fringillidae  | <i>Spinus tristis</i>            | American Goldfinch       |                     | V      | V      | V      | S,V            |        |        |        |        |        |        | V      |        | V      |
| Hirundinidae  | <i>Hirundo rustica</i>           | Barn Swallow             |                     |        |        |        |                |        |        |        | FO     |        |        |        |        |        |
| Icteridae     | <i>Agelaius phoeniceus</i>       | Red-winged Blackbird     | S                   | S      |        | V      |                |        | V      | S,V    | S      | S      |        |        |        |        |
| Icteridae     | <i>Dolichonyx oryzivorus</i>     | Bobolink                 |                     |        |        |        |                |        | S      | A,S    | S      | S,P    |        |        |        |        |
| Icteridae     | <i>Icterus galbula</i>           | Baltimore Oriole         | S                   | S      |        |        | S              |        |        |        |        | S,P    | S      |        |        |        |
| Icteridae     | <i>Molothrus ater</i>            | Brown-headed Cowbird     |                     |        | V      | V      | V              |        |        | V      |        | V      |        |        |        |        |
| Icteridae     | <i>Quiscalus quiscula</i>        | Common Grackle           |                     |        |        |        |                |        |        |        |        |        |        | H      |        |        |
| Icteridae     | <i>Sturnella magna</i>           | Eastern Meadowlark       |                     |        |        |        | S              |        |        | S,A    | S,V,A  | S,P    |        |        |        |        |
| Laridae       | <i>Larus delawarensis</i>        | Ring-billed Gull         |                     |        |        |        |                |        |        |        | FO     |        |        | FO     |        |        |
| Paridae       | <i>Poecile atricapillus</i>      | Black-capped Chickadee   |                     | S      |        |        |                |        |        |        |        |        |        | V      |        | V      |
| Parulidae     | <i>Geothlypis philadelphia</i>   | Mourning Warbler         |                     |        |        |        |                | S      |        |        |        |        |        |        |        | S      |
| Parulidae     | <i>Geothlypis trichas</i>        | Common Yellowthroat      |                     |        |        |        |                |        | S      |        | S      | S      |        |        |        |        |
| Parulidae     | <i>Mniotilta varia</i>           | Black-and-white Warbler  |                     |        |        | S      |                |        |        |        |        |        |        | S      |        |        |
| Parulidae     | <i>Oreothlypis ruficapilla</i>   | Nashville Warbler        |                     |        |        |        |                |        |        |        |        |        |        |        |        |        |
| Parulidae     | <i>Setophaga petechia</i>        | Yellow Warbler           |                     |        |        |        | S              |        |        |        |        |        |        |        |        |        |
| Parulidae     | <i>Setophaga ruticilla</i>       | American Redstart        |                     |        | S      | S      |                | S      | S      | S      | S      |        |        |        |        |        |
| Passerellidae | <i>Melospiza georgiana</i>       | Swamp Sparrow            |                     | S      |        |        |                |        |        |        |        |        |        |        |        |        |
| Passerellidae | <i>Melospiza melodia</i>         | Song Sparrow             | S                   |        | S      | S      | S              | S      |        | S      | S      | S      |        | S      | S      |        |
| Passerellidae | <i>Spizella passerina</i>        | Chipping Sparrow         |                     |        |        |        |                | S      |        | S      |        | S      |        |        |        |        |
| Passerellidae | <i>Spizella pusilla</i>          | Field Sparrow            |                     |        |        |        |                |        |        |        |        |        |        | S      |        |        |
| Passerellidae | <i>Zonotrichia albicollis</i>    | White-throated Sparrow   |                     |        |        |        |                |        |        |        |        |        |        |        |        |        |
| Picidae       | <i>Colaptes auratus</i>          | Northern Flicker         |                     |        |        |        |                |        |        |        |        |        | V      |        |        |        |
| Picidae       | <i>Dryocopus pileatus</i>        | Pileated Woodpecker      |                     |        |        |        |                |        |        |        |        |        |        |        |        |        |
| Picidae       | <i>Sphyrapicus varius</i>        | Yellow-bellied Sapsucker |                     |        | H      |        |                |        |        |        |        |        |        |        |        | H      |
| Sturnidae     | <i>Sturnus vulgaris</i>          | European Starling        |                     |        |        |        |                | H      |        |        |        | H      |        |        |        |        |
| Troglodytidae | <i>Troglodytes aedon</i>         | House Wren               |                     | S      | S      |        | S              | S      | S      |        |        |        | S      |        | S,V    | S      |
| Troglodytidae | <i>Troglodytes hiemalis</i>      | Winter Wren              |                     |        |        |        |                |        |        |        |        |        |        |        | S      | S      |
| Turdidae      | <i>Turdus migratorius</i>        | American Robin           |                     |        |        | V      |                |        |        | V,S    |        |        |        | S      |        | S      |
| Tyrannidae    | <i>Contopus virens</i>           | Eastern Wood-pewee       |                     |        |        | S      |                | S      |        | S      |        |        | S      |        |        | S      |
| Tyrannidae    | <i>Myiarchus crinitus</i>        | Great Crested Flycatcher | V                   |        |        |        | V              |        |        |        |        |        | S      |        | H      |        |
| Tyrannidae    | <i>Tyrannus tyrannus</i>         | Eastern Kingbird         |                     |        |        |        |                |        | S      | V      |        |        |        |        |        |        |
| Vireonidae    | <i>Vireo gilvus</i>              | Warbling Vireo           |                     | S      |        |        | S              | S      |        |        | S      | S      |        |        |        |        |
| Vireonidae    | <i>Vireo olivaceus</i>           | Red-eyed Vireo           |                     | S      |        |        | S              |        | S      |        | S      |        | S      |        | S      | S      |

Observation Conditions:

June 11, 2019 - Observers: David d'Entremont, Jason Runtas, Tempurature 12<sup>o</sup>C, Cloud Cover 0% , Wind: B2, Precipitation: Nil., Start 7:29a.m. End 9:25a.m.

June 27, 2019 - Observer: David d'Entremont, Tempurature 17<sup>o</sup>C, Cloud Cover 0% , Wind: B0, Precipitation: Nil., Start 7:18a.m. End 9:02a.m.

<sup>1</sup> Breeding Bird Evidence Codes: X - Species observed, C - Call heard, FO - Flyover (Species presence); H - Species observed in its breeding season in suitable nesting habitat, S - Singing male (Possible Breeding); P - Pair observed , T - Territorial behaviour, B - Breeding display or nest hole (Probable Breeding); DD - Distraction display or injury feigning, NU - Used Nest or egg shells, FY - Recently fledged young, AE - Adult leaving or entering nest sites, FS - Adult carrying fecal sac, CF - Adult carrying food for young, NE - Nest content

<sup>2</sup>Breeding Evidence - based on OBBA methodology

<sup>3</sup> Conservation Rankings: From Ontario Ministry of Natural Resources, Natural Heritage Information Centre ([http://nhic.mnr.gov.on.ca/nhic\\_.cfm](http://nhic.mnr.gov.on.ca/nhic_.cfm))

| 8      |        | 9      |        | Breeding Evidence <sup>2</sup> | Conservation Rank <sup>3</sup> |         |      |      |       |
|--------|--------|--------|--------|--------------------------------|--------------------------------|---------|------|------|-------|
| 11-Jun | 27-Jun | 11-Jun | 27-Jun |                                | GRANK                          | SRANK   | MNRF | SARA | TRACK |
|        |        |        |        | Possible                       | G5                             | S5      |      |      | N     |
|        | V      |        |        | Possible                       | G5                             | S5B     |      |      | N     |
| S      | V      |        |        | Possible                       | G5                             | S5      |      |      | N     |
|        |        | S      |        | Possible                       | G5                             | S5B     |      |      | N     |
| V      | V      |        | V      | Possible                       | G5                             | S5B     |      |      | N     |
|        |        |        | V      | Possible                       | G5                             | S5      |      |      | N     |
|        |        | S      |        | Possible                       | G5                             | S5B     |      |      | N     |
|        | V      | V      |        | Probable                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | None                           | G5                             | S4B     | THR  | THR  | Y     |
|        | S      |        |        | Probable                       | G5                             | S4      |      |      | N     |
|        |        |        |        | Probable                       | G5                             | S4B     | THR  | THR  | Y     |
|        |        |        |        | Probable                       | G5                             | S4B     |      |      | N     |
|        |        |        |        | Probable                       | G5                             | S4B     |      |      | N     |
|        |        |        |        | Possible                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | Probable                       | G5                             | S4B     | THR  | THR  | Y     |
| V      |        | FO     |        | None                           | G5                             | S5B,S4N |      |      | N     |
| V      | S      |        |        | Probable                       | G5                             | S5      |      |      | N     |
|        |        |        | S      | Possible                       | G5                             | S4B     |      |      | N     |
|        |        |        |        | Probable                       | G5                             | S5B     |      |      | N     |
|        |        | S      | S      | Probable                       | G5                             | S5B     |      |      | N     |
|        |        | S      |        | Possible                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | Possible                       | G5                             | S5B     |      |      | N     |
|        |        | S      | S      | Probable                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | Possible                       | G5                             | S5B     |      |      | N     |
|        |        | S      |        | Probable                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | Possible                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | Possible                       | G5                             | S4B     |      |      | N     |
|        | S      |        |        | Possible                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | Possible                       | G5                             | S4B     |      |      | N     |
|        |        |        | V      | Possible                       | G5                             | S5      |      |      | N     |
|        |        |        |        | Possible                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | Possible                       | G5                             | SNA     |      |      | N     |
| S      |        | S      |        | Probable                       | G5                             | S5B     |      |      | N     |
|        |        |        |        | Probable                       | G5                             | S5B     |      |      | N     |
|        | V      |        | V      | Possible                       | G5                             | S5B     |      |      | N     |
| S      |        | S      | S      | Probable                       | G5                             | S4B     | SC   | SC   | Y     |
|        |        |        |        | Possible                       | G5                             | S4B     |      |      | N     |
|        |        |        |        | Probable                       | G5                             | S4B     |      |      | N     |
|        |        |        |        | Probable                       | G5                             | S5B     |      |      | N     |
| S      | S,V    | S      | S      | Probable                       | G5                             | S5B     |      |      | N     |

jr, A - Agitated behaviour or anxiety calls of adult, V - Visiting a probably nest site, N - Nest building or excavation of  
aining eggs, NY - Nest with young seen or heard (Confirmed Breeding).



# APPENDIX F

## Natural Heritage Information Centre Records for the Subject Lands

NHIC Data – Grid 17NK5729

| Type         | Common Name                        | Scientific Name     | SRank | SARO Status | COSEWIC Status | Last Obs Date | EO ID | Details URL                                                                                                                                                                                                   |
|--------------|------------------------------------|---------------------|-------|-------------|----------------|---------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NATURAL AREA | Silver Creek Wetland Complex (CL7) |                     |       |             |                |               | 20093 | <a href="http://nhic.mnr.gov.on.ca/natural_areas/areas.php?source=MaMNHA&amp;feature=NA&amp;areaid=20093">http://nhic.mnr.gov.on.ca/natural_areas/areas.php?source=MaMNHA&amp;feature=NA&amp;areaid=20093</a> |
| SPECIES      | Snapping Turtle                    | Chelydra serpentina | S3    | SC          | SC             | 1994-06-29    | 96117 | <a href="http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgriddetail&amp;nhic_eo_id=96117">http://nhic.mnr.gov.on.ca/reports/public_details.php?source=1kmgriddetail&amp;nhic_eo_id=96117</a>   |

# APPENDIX G

## Nottawasaga Valley Conservation Authority Watershed Improvement Program

## **N-WIP Program**

### **Nottawasaga Watershed Improvement Program (N-WIP)**

#### **What is NWIP?**



The goal of N-WIP is to improve the health of Georgian Bay by undertaking water quality improvement projects on local tributary streams in the towns of The Blue Mountains, Collingwood, and Wasaga Beach, and the townships of Clearview, Springwater and Essa.

(For a map of the area, click [here](#)).

N-WIP is a pilot project of the Lake Huron-Georgian Bay Watershed - Canadian Framework for Community Action. For a program overview, please visit [www.lakehuroncommunityaction.ca](http://www.lakehuroncommunityaction.ca).



The following types of water quality improvement projects may be undertaken by the N-WIP committee:

- Buffer strip development/land retirement
- Livestock exclusion fencing/water crossing/alternate water source
- Erosion control/habitat improvement (e.g. fish habitat friendly retaining walls)
- In-channel habitat improvement
- Riparian reforestation
- Clean water diversion
- Restoration of natural channel features in municipal drains
- Implementation of municipal drain management environmental BMPs

Locally, N-WIP is coordinated by the NVCA and includes the following local



partners:

Blue Mountain Watershed Trust  
Collingwood Collegiate Institute  
Elmvale District High School  
Environment Canada  
Georgian Triangle Anglers Association  
Jean Vanier High School  
North Simcoe Land Stewardship Network  
Nottawasaga Steelheaders  
Ontario Ministry of Natural Resources  
Simcoe County Christian Farmers Association  
Simcoe County Federation of Agriculture  
South Simcoe Streams Network  
Stayner Collegiate Institute  
Town of Collingwood  
Town of the Blue Mountains  
Town of Wasaga Beach  
Township of Clearview  
Township of Essa  
Township of Springwater  
Township of Tiny  
Wasaga Beach Fish and Game Club  
Wasaga Beach Provincial Park  
Wasaga Beach River Resources Committee  
Wild Canada

Corporate sponsors of N-WIP include:

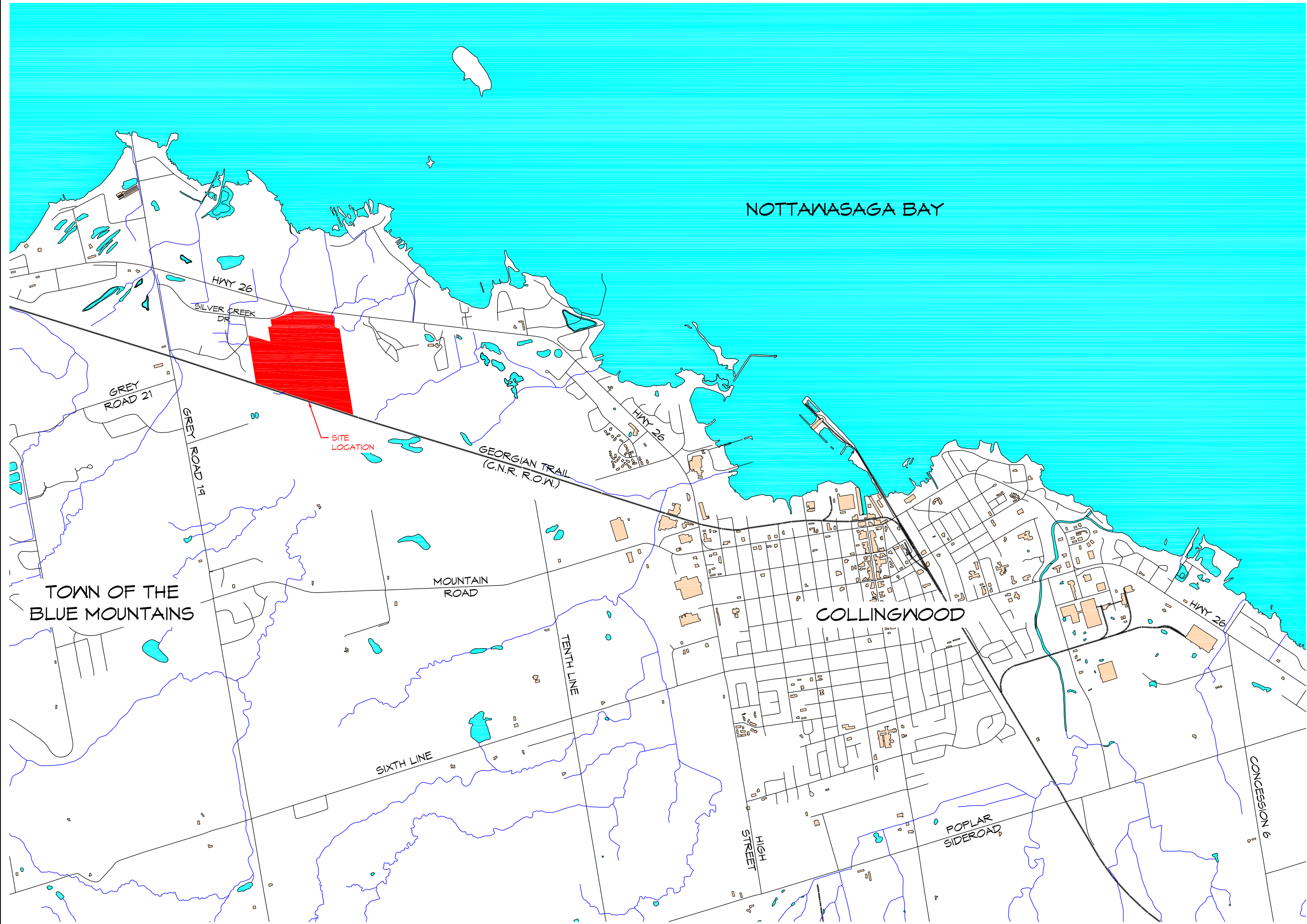


For more information on the N-WIP Committee and projects, please contact Fred Dobbs, Manager of Stewardship Services, at (705) 424-1479, ext. 237 or [fdobbs@nvca.on.ca](mailto:fdobbs@nvca.on.ca).



## **FIGURES**

- Figure 1:           Site Location Plan**
- Figure 2:           NVCA Regulated Areas**
- Figure 3:           Bedrock Geology**
- Figure 4:           Surficial Geology**
- Figure 5:           Ecological Land Classification**
- Figure 6:           PSW Features**
- Figure 7:           Breeding Amphibian Locations, 2010**
- Figure 8:           Breeding Bird and Breeding Amphibian Locations, 2019**
- Figure 9:           Proposed Development Concept**
- Figure 10:          Constraints to Development**



**Key Plan** (n.t.s.)

**Legend**

- ROADS
- RAILWAY
- WATERCOURSE
- WATERBODY
- EXISTING BUILDINGS

N

0 150 300 600 900 1200 m

1 : 30,000

| No. | Revised | Date | Int. |
|-----|---------|------|------|
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**PROJECT**  
Huntingwood Trails  
Collingwood, ON

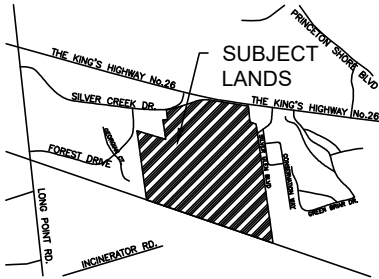
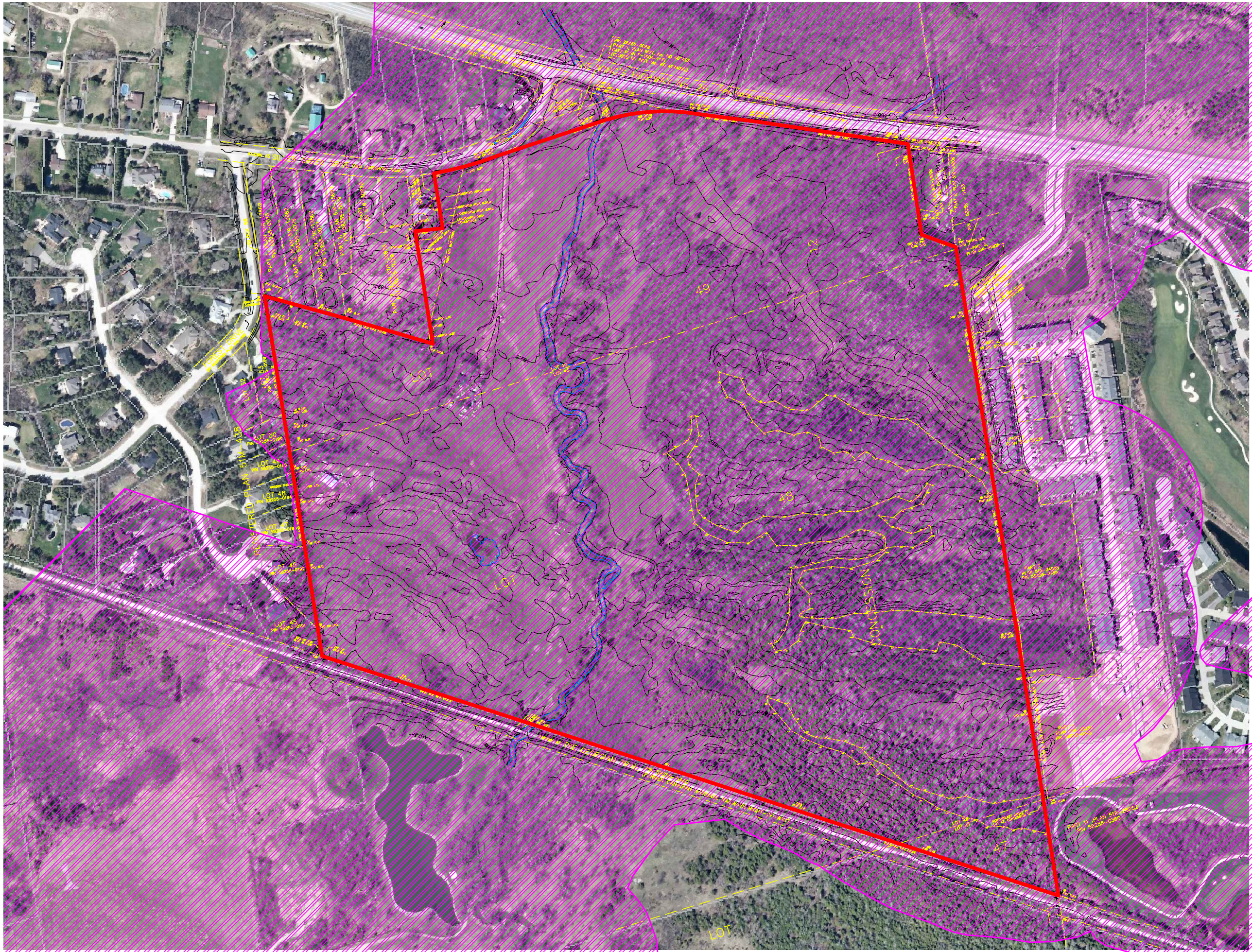
**TITLE**  
SITE LOCATION

**SEAL**

|                         |              |
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| Date: January 2011      |              |
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| Drawn by: CM            |              |
| Checked by: MH          |              |

Job No:

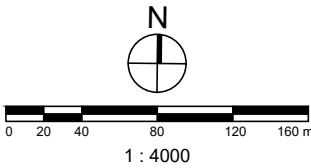




KEY PLAN  
SCALE: N.T.S.

LEGEND

- PROPERTY BOUNDARY
- NOTTAWASAGA VALLEY CONSERVATION AUTHORITY (NVCA) REGULATION LIMITS



Project  
HUNTINGWOOD TRAILS  
COLLINGWOOD, ONTARIO

Title  
NOTTAWASAGA VALLEY CONSERVATION  
AUTHORITY (NVCA) REGULATION

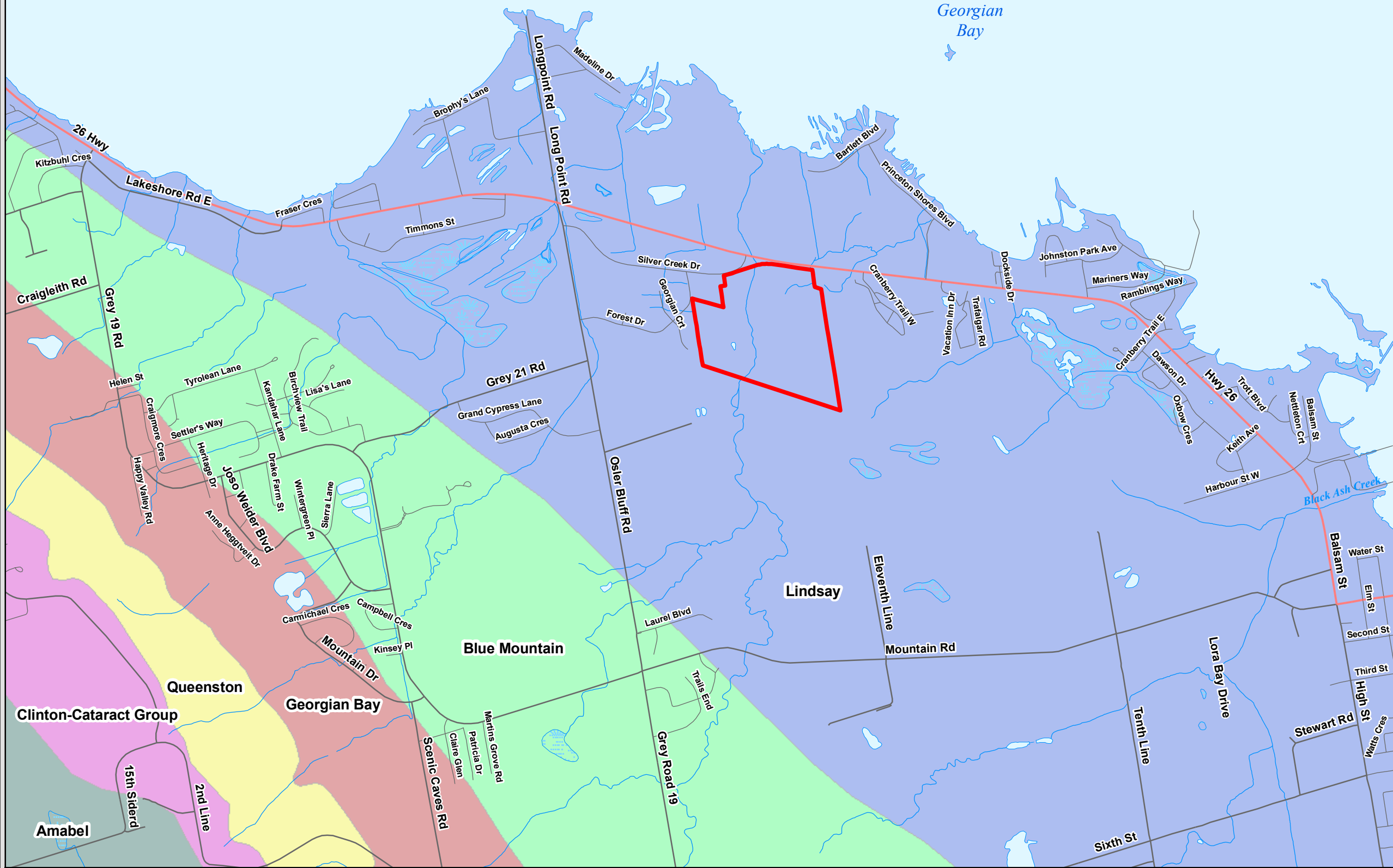


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| Drawn By | D.C.       | Design By | M.H. | Project | CR-ENV-HUNTINGWOOD |
| Date     | 2019/07/29 | Check By  | M.H. | Scale   | 1:4000             |
|          |            |           |      | Drawing | Figure 2           |



| Unit                   | Description                                                                                                                                                                                                                                                                                                                   |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Amabel                 | white to blue-grey, thick-to massive-bedded, dolostone, including crinoidal grainstones and biothermal dolostone (unsibdivided, Wiarton or Wiarton/Colpoy BayMg); Bruce Peninsula: lower part is thin-to medium-bedded, grey to grey-brown, fine-crystalline dolostone(Lions Head Mb); Manitoulin Island:variety of dolostone |
| Blue Mountain          | dark blue-grey to brown to black shale, with thin interbeds of limestone or calcareous siltstone                                                                                                                                                                                                                              |
| Clinton-Cataract Group | thin units variously shale-, sandstone-,dolostone- or limestone-dominated; one or more of Whirlpool, Manitoulin, Cabot Head, Grimsby, Thorold, Neahga, Reynales, Irondequoit, Teynales, Rochester, Decew, Dyer Bay, Windfield, St. Edmund, or Fossil Hill Formation                                                           |
| Georgian Bay           | interbedded grey-green to dark grey shale and fossiliferous calcareous siltstone to bioclastic limestone                                                                                                                                                                                                                      |
| Lindsay                | fine- to coarse-grained, fossiliferous, commonly nodular, argillaceous limestone; upper member (Collingwood) is black, organic-rich, fissile, very fine-grained limestone                                                                                                                                                     |
| Queenston              | red shale and siltstone, minor green shale and siltstone, and variable calcareous siltstone to sandstone and limestone interbeds                                                                                                                                                                                              |



### Legend

Property Boundary

#### Roads

— Highway

— Major Road

— Local Road

#### Rivers

--- Intermittent Stream

— Permanent Stream

#### Lakes and Wetlands

Waterbody Segment

  Wetland Area, Permanent

#### Bedrock Geology

19: Amabel

17: Clinton-Cataract Group

16: Queenston

14: Georgian Bay

12: Blue Mountain

11: Lindsay

Basemapping from Ontario Ministry of Natural Resources

N

m

1:24,000  
UTM Zone 17N, NAD 83

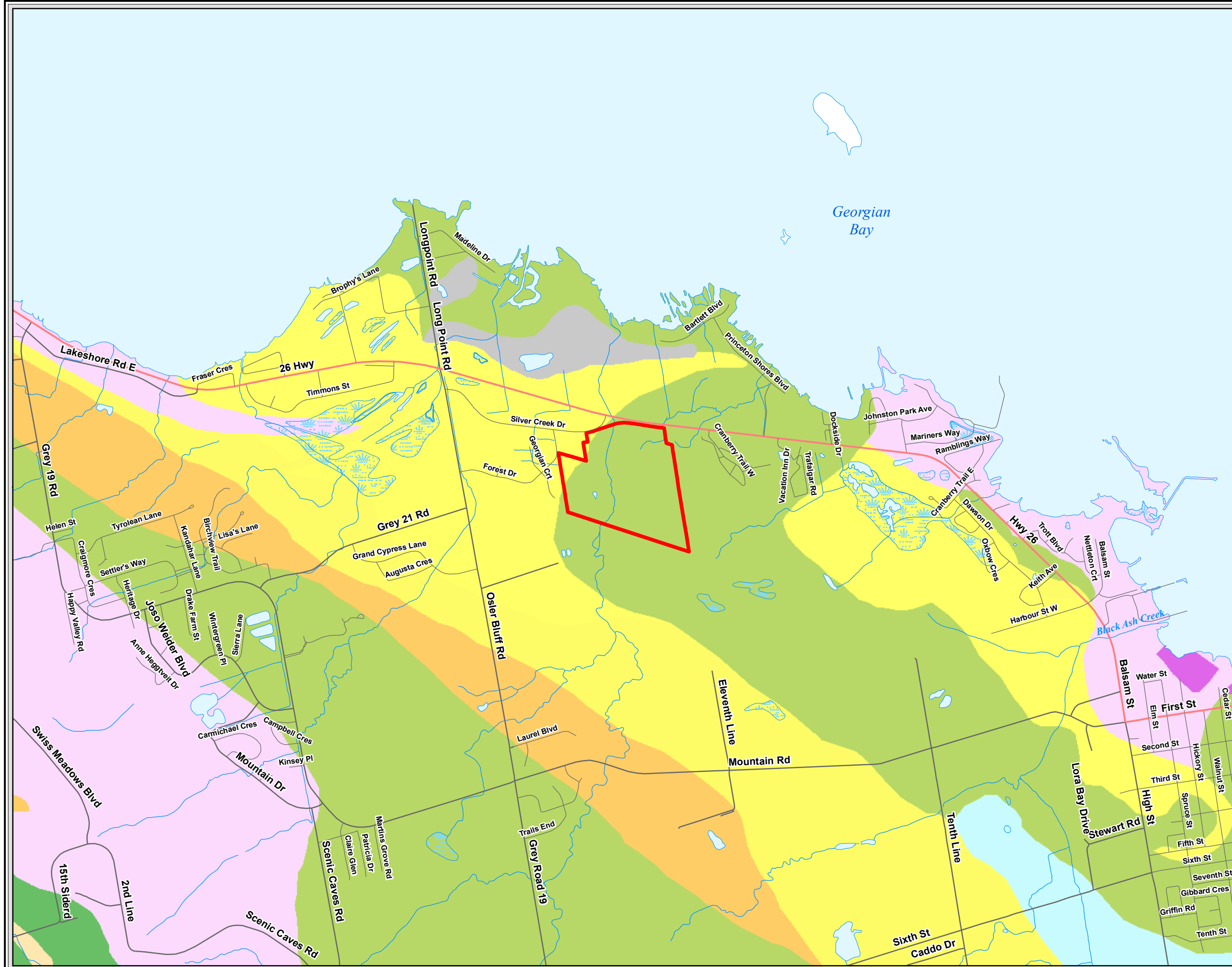
Huntingwood

## Bedrock Geology

January 2011

**Hensel Design Group**

Figure 3



**Legend**

Property Boundary

**Rivers**

Intermittent Stream

Permanent Stream

**Lakes and Wetlands**

Waterbody Segment

Wetland Area, Permanent

**Surficial Geology**

21: Man-made deposits

20: Organic deposits

19: Modern alluvial deposits

**14: Coarse-textured lacustrine deposits**

14b: Littoral-foreshore deposits

**9: Coarse-textured glaciolacustrine deposits**

9b: Littoral-foreshore deposits

9c: Foreshore-basinal deposits

**8: Fine-textured glaciolacustrine deposits**

8a: Massive-well laminated

**7: Glaciofluvial deposits**

7a: Sandy deposits

**6: Ice-contact stratified deposits**

6: Ice-contact stratified deposits

**5: Tills**

5b: Stone-poor, carbonate-derived silty to sandy till

5d: Glaciolacustrine-derived silty to clayey till

**3: Paleozoic Bedrock**

3: Paleozoic bedrock

Basemapping from Ontario Ministry of Natural Resources

N

m

0 150 300 600 900 1,200

1:24,000

UTM Zone 17N, NAD 83

Huntingwood

**Surficial Geology Regional Context**

January 2011

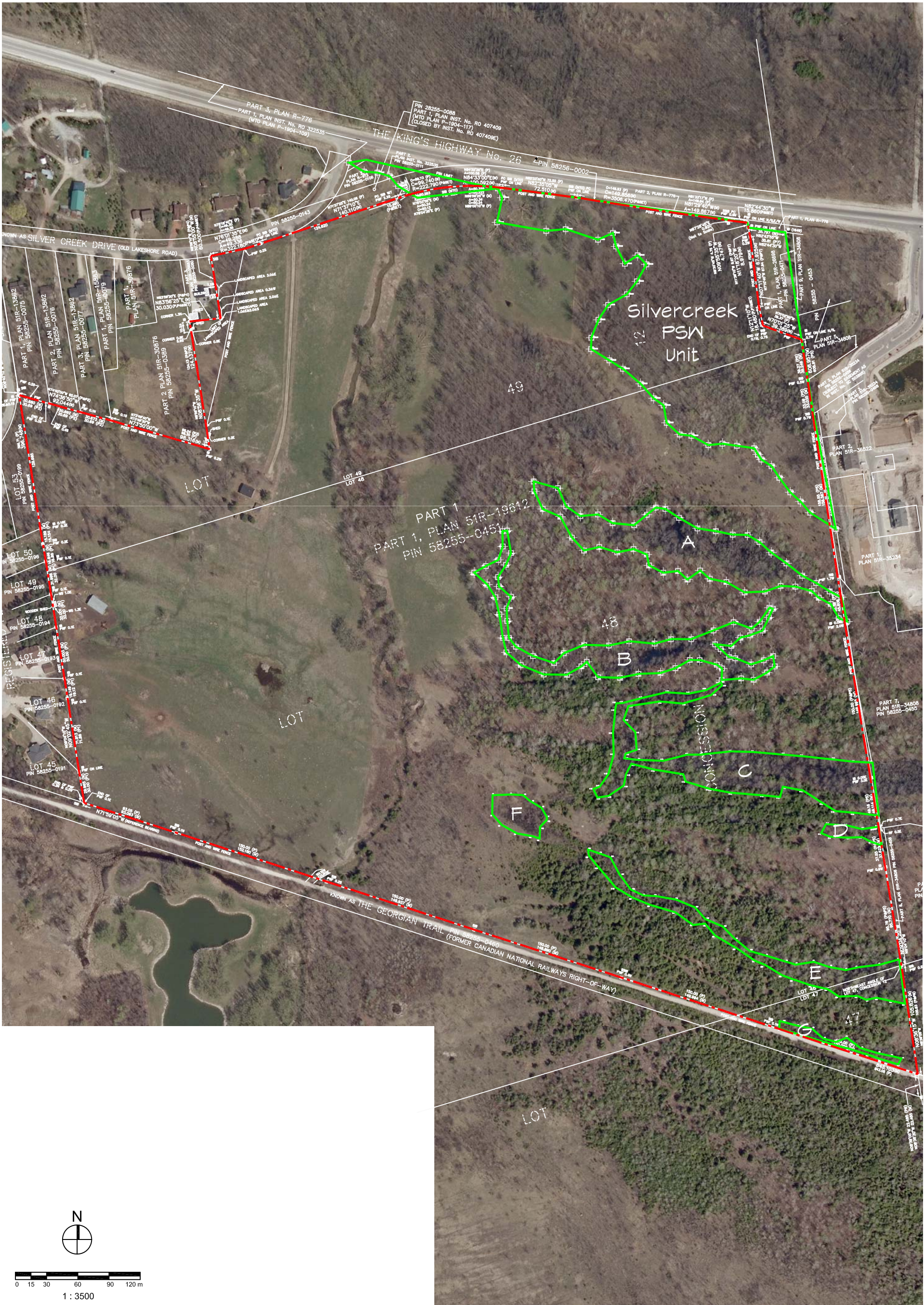
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**Figure 4**









**Legend**

--- PROPERTY BOUNDARY

--- WETLAND BOUNDARY

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|     |          |      |      |  |
| No. | Revision | Date | Init |  |

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PROJECT

Huntingwood Development  
Collingwood, Ontario

TITLE

PSW FEATURES

Scale: 1:3500

Date: October 2010

CAD File: HDG\_HTW\_Fig-6

Drawn by: CM

Checked by: SH

Job No: -

Seal: [Signature]

Seal: [Signature]

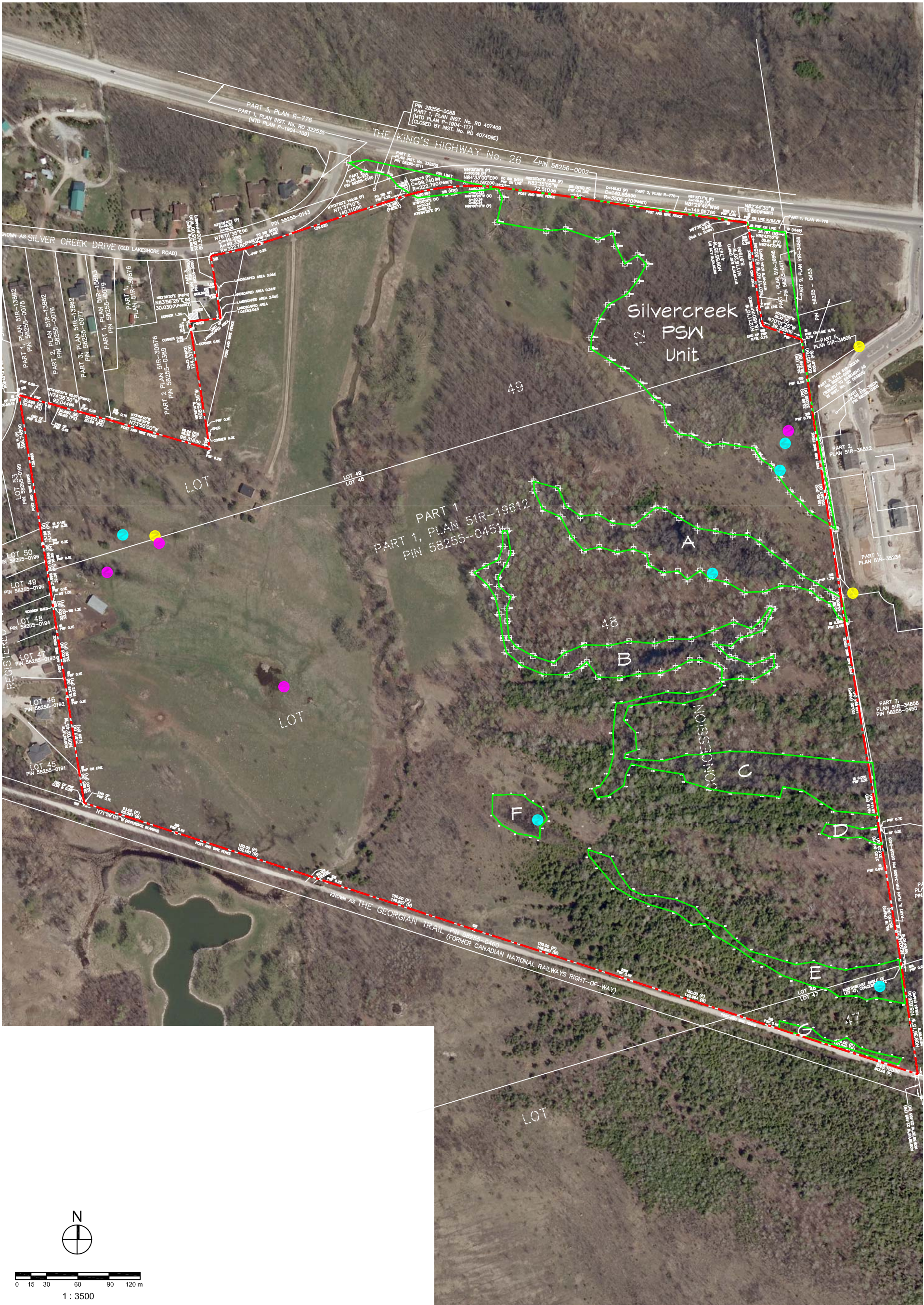
ASSOCIATION OF LANDSCAPE ARCHITECTS

MEMBER

Fig 6

Drawing No.





- Legend**
- PROPERTY BOUNDARY
  - WETLAND BOUNDARY
  - AMPHIBIAN SURVEY - APRIL 4, 2010
  - AMPHIBIAN SURVEY - APRIL 23, 2010
  - AMPHIBIAN SURVEY - JUNE 11, 2010

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|     |          |      |      |  |
| No. | Revision | Date | Init |  |

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PROJECT  
**Huntingwood Trails**  
Collingwood, Ontario

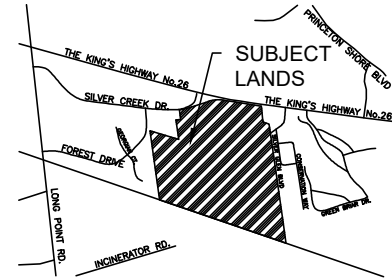
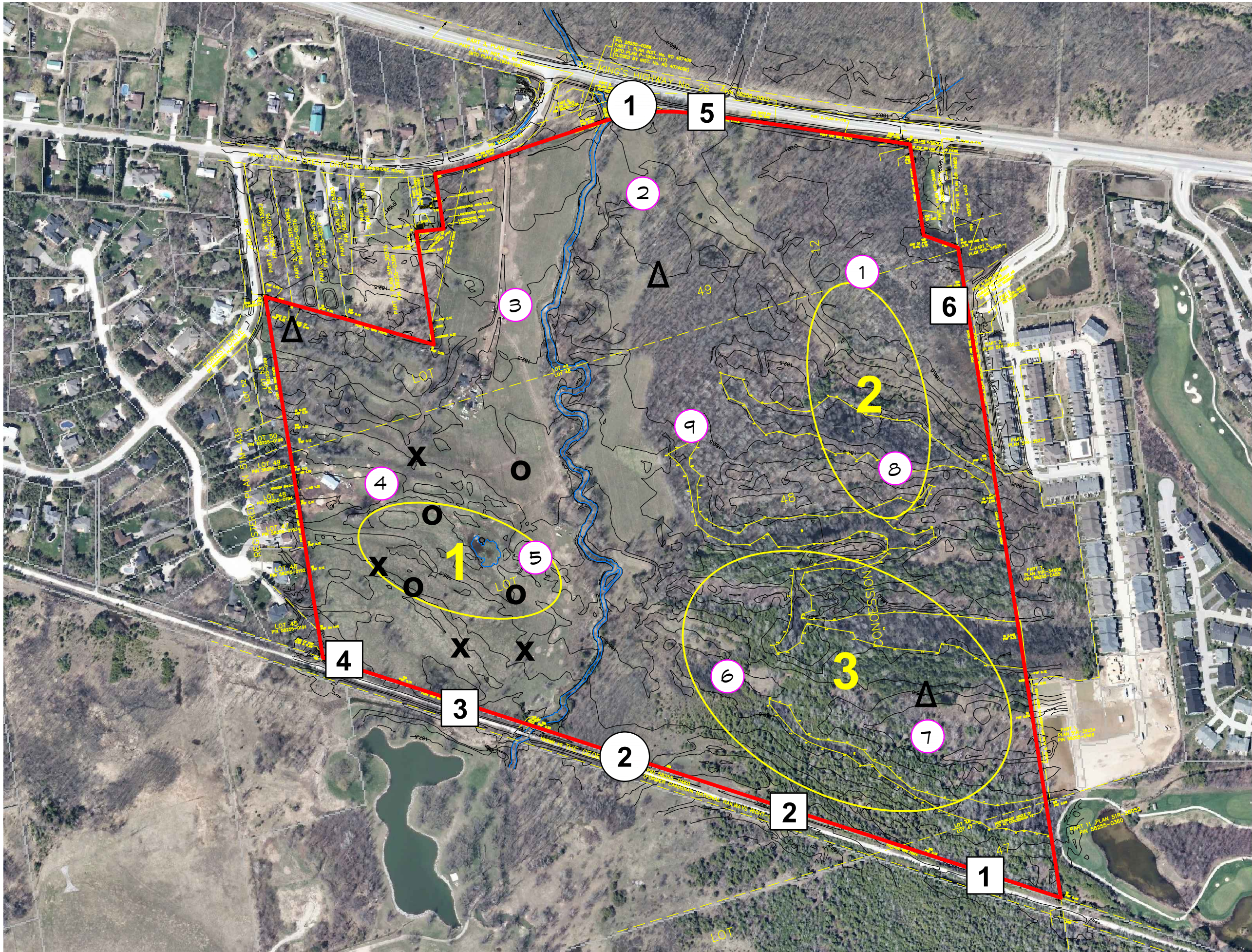
TITLE  
**BREEDING AMPHIBIANS**

Scale: 1:3500  
Date: October 2010  
CAD File: HDG\_HTW\_Fig-7  
Drawn by: CM  
Checked by: SH  
Job No: -



Drawing No.  
**Fig 7**





KEY PLAN  
SCALE: N.T.S.

LEGEND

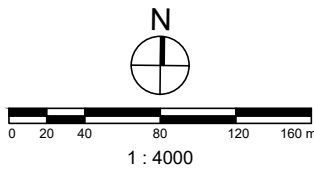
- PROPERTY BOUNDARY
- AMPHIBIANS CALLING AREAS
- BREEDING BIRD COUNT STATION
- DAWN BREEDING BIRD SURVEY STATION NUMBER

SAR BIRD LOCATIONS

- EASTERN WOOD PEWEE (SC)
- EASTERN MEADOWLARK (THR)
- BOBOLINK (THR)

SAMPLE STATIONS

- NOCTURNAL BIRD POINT COUNT STATIONS
- EVENING AMPHIBIAN POINT COUNT STATIONS



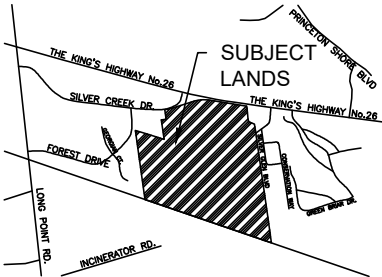
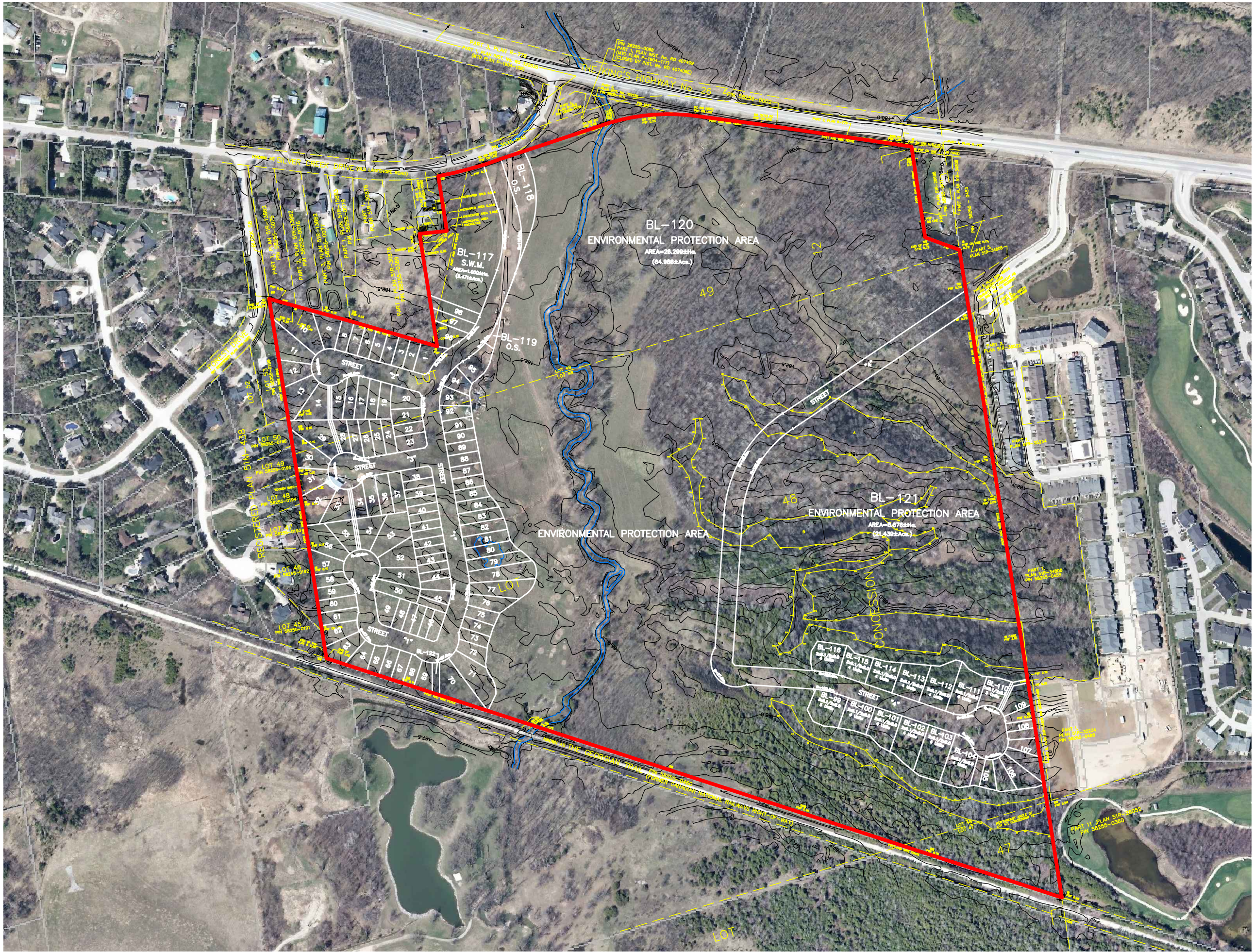
Project  
HUNTINGWOOD TRAILS  
COLLINGWOOD, ONTARIO

Title  
BREEDING BIRDS AND  
BREEDING AMPHIBIANS 2019

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| Drawn By | D.C.       | Design By | M.H. | Project | CR-ENV-HUNTINGWOOD |
| Date     | 2019/07/29 | Check By  | M.H. | Scale   | 1:4000             |
|          |            |           |      | Drawing | Figure 8           |

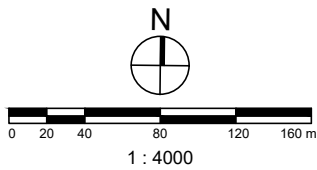




KEY PLAN  
SCALE: N.T.S.

LEGEND

 PROPERTY BOUNDARY



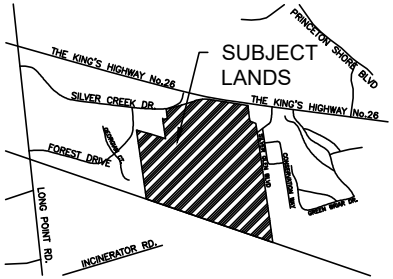
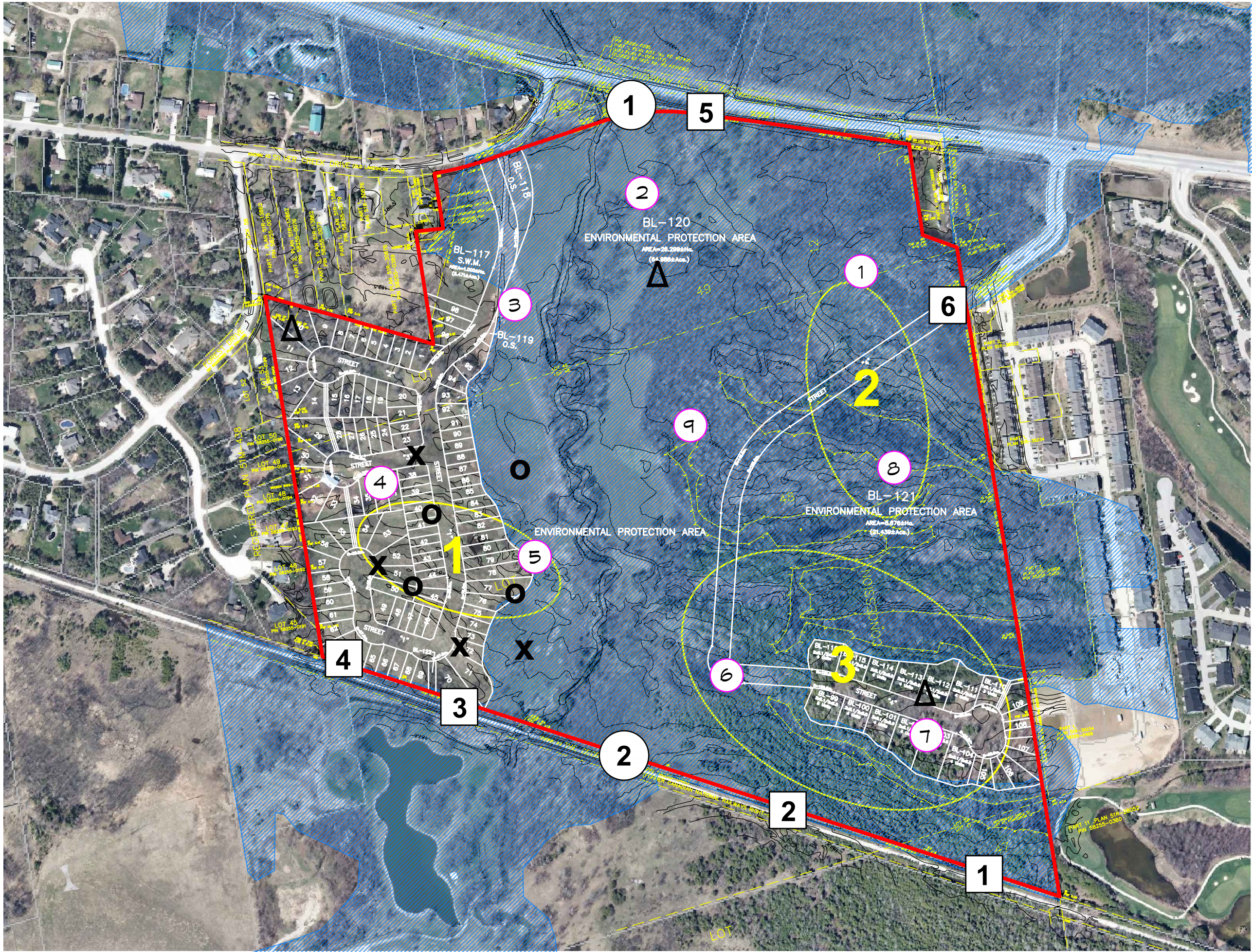
Project HUNTINGWOOD TRAILS  
COLLINGWOOD, ONTARIO

Title DEVELOPMENT  
CONCEPT

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| Date     | 2019/07/29 | Check By  | M.H. | Scale   | 1:4000             |
|          |            |           |      | Drawing | Figure 9           |





KEY PLAN  
SCALE: N.T.S.

LEGEND

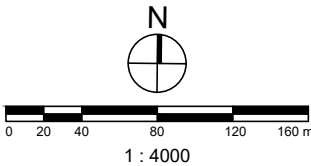
- PROPERTY BOUNDARY
- ENVIRONMENTAL PROTECTION AREA
- AMPHIBIANS CALLING AREAS
- BREEDING BIRD COUNT STATION
- DAWN BREEDING BIRD SURVEY STATION NUMBER

SAR BIRD LOCATIONS

- EASTERN WOOD PEWEE (SC)
- EASTERN MEADOWLARK (THR)
- BOBOLINK (THR)

SAMPLE STATIONS

- NOCTURNAL BIRD POINT COUNT STATIONS
- EVENING AMPHIBIAN POINT COUNT STATIONS



Project  
HUNTINGWOOD TRAILS  
COLLINGWOOD, ONTARIO

Title  
CONSTRAINTS TO  
DEVELOPMENT

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| Date     | 2019/07/29 | Check By  | M.H. | Scale   | 1:4000             |
|          |            |           |      | Drawing | Figure 10          |