Scoped Environmental Impact Study

5431 Eighth Line
Erin, ON

DECEMBER 2018

SAVANTA

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Report Prepared for:

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1.0 INTRODUCTION

1.1 Project Overview

Savanta Inc. (Savanta) was retained by Homes in the Hills Inc. to conduct a scoped Environmental Impact Study (EIS) for a proposed residential development at 5431 Eighth Line, located on part of Lot 14, Concession 9 in the Town of Erin, ON. The property (referred to herein as the 'Subject Lands') is located east of Eighth Line and northwest of Forest Ridge Road/Delarmbro Dr. (**Figure 1**, **Appendix A**).

The Subject Lands are a mixture of agricultural lands and natural areas, with active hay operation occurring on the agricultural lands (**Figure 2**, **Appendix A**).

1.2 Purpose of the Report

An EIS is required to assess the potential impacts associated with the proposed development on the natural heritage features and associated functions on the Subject Lands. In this case, the EIS has been scoped through consultation with Credit Valley Conservation (CVC). This work considers applicable provincial and municipal requirements and policies including reference to the natural heritage policies of the Provincial Policy Statement (PPS; MMAH 2014) and associated provincial guidance contained in the Natural Heritage Reference Manual (NHRM; MNR 2010).

The scoped EIS is a requirement of the municipal planning process and is intended to fulfill the policies of the Town of Erin, Wellington County, and Credit Valley Conservation.

The study components to date have included:

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

2.0 NATURAL HERITAGE LEGISLATION AND POLICY CONTEXT

An assessment of the natural heritage features found on, and adjacent to, the Subject Lands and the potential impacts to these features from the proposed development applications was undertaken in association with the following legislation, policies and agency programs:

- The Town of Erin Official Plan, 2012;
- Wellington County Official Plan, 2015 office consolidation;
- Credit Valley Conservation (CVC);
- Ontario's Provincial Policy Statement (PPS);
- Ontario's Endangered Species Act, 2007 (ESA; Government of Ontario 2008); and,
- Ontario's Greenbelt Plan, 2017 (MMAH 2017).

2.1 Town of Erin Official Plan

The Town of Erin Official Plan (OP) was approved by Wellington County Council on December 14, 2004 and includes modification and applications to May 2012. The Town of Erin Official Plan states "the principles and policies contained in this Plan are to provide guidance in the consideration of zoning and other by-laws, plans for subdivision or condominium, consents and minor variances, community improvement projects and other matters which relate to land use changes."

Schedule A-2: Land Use shows the Subject Lands as 'Future Development' in which development is permitted, with 'Residential', 'Greenlands' and 'Core Greenlands' surrounding the lands. The Town of Erin Official Plan identifies Core Greenlands as including wetlands, habitat of threatened or endangered species, and floodways and hazardous lands, while the Greenlands designation includes other significant natural heritage features including fish, wildlife and plant habitat, Areas of Natural and Scientific Interest (ANSI), streams and valleylands, woodlands, Environmentally Significant Areas (ESAs), ponds, lakes and reservoirs and natural links.

With respect to the Core Greenlands, the Town of Erin Official Plan does not permit development or site alteration within PSWs or significant portions of the habitat or threatened or endangered species, and restricts uses within other areas identified as Core Greenlands. Development is permitted within the Greenlands designation, provided that there are no significant negative impacts on the Greenlands.

Section 5.16.3 outlines the requirements for environmental impact assessments to be completed where development is proposed adjacent to features in the Core Greenlands and Greenlands designation. Adjacent is defined in the Official Plan as areas within 120 m of PSWs and 30 m of all other features.

2.2 Wellington County Official Plan

The Wellington County Official Plan (WCOP) was adopted by Wellington County Council on September 24, 1998. The WCOP states that "Wellington County is a good place to live. This plan intends to keep it that way." The WCOP is intended to provide guidance over the next 20 years, to the physical development of the County, its local municipalities and to the long term protection of County resources.

Schedule A2: Regional Structure designates the Subject Lands as “Urban Centre”, and Schedule A2-1: Town of Erin Greenbelt Plan shows the Subject Lands as situated within a designated “Settlement Area” of the Greenbelt Plan.

2.3 Credit Valley Conservation

The CVC Regulation Limit delineates hazardous lands, wetlands, shorelines and areas susceptible to flooding, and associated allowances. Pursuant to the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation* (Ontario Regulation 160/06), any development in or on areas defined in the Regulation (e.g., river or stream valleys, hazardous land, wetlands) requires permission from CVC. CVC may grant permission for development in or on these areas if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development. The Regulation also states that it is prohibited to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream or watercourse or change or interfere in any way with a wetland without permission from the CVC.

2.4 Provincial Policy Statement

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

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

Eight (8) types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Fish habitat;
- Habitat of endangered and threatened species; and,
- Significant ANSIs.

Development and site alteration shall not be permitted in significant wetlands, or in significant coastal wetlands in Ecoregions 5E, 6E and 7E. The Subject Lands are located in Ecoregion 6E. Development and site alteration shall not be permitted in: significant woodlands, significant valleylands, significant wildlife habitat or significant ANSIs, unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Development and site alteration shall not be permitted in the habitat of endangered and threatened species or in fish habitat, except in accordance with provincial and federal

requirements. Development and site alteration may be permitted on lands adjacent to fish habitat, provided it has been demonstrated that there will be no negative impacts on the natural feature or their ecological functions.

2.5 Provincial Endangered Species Act, 2007

The provincial *Endangered Species Act, 2007* (ESA) was developed to:

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

The ESA protects all threatened, endangered and extirpated species listed on the Species at Risk in Ontario (SARO) list. These species are legally protected from harm or harassment and their associated habitats are legally protected from damage or destruction, as defined under the ESA.

Species at Risk are discussed throughout the report, including Natural Heritage Information Centre (NHIC) records, MNRF records and species and/or their habitat observed during field investigations.

2.6 The Greenbelt Plan, 2017

The Greenbelt Plan was introduced in 2005, and updated in 2017, to assist in establishing a land use planning framework for the Greater Golden Horseshoe region of the province. The Greenbelt Plan overlaps with the Niagara Escarpment Plan Area and Oak Ridges Moraine Area, providing connections between these systems and the surrounding environments.

The Subject Lands are located within the Greenbelt Plan Area and are designated as being within Towns/Villages of the Protected Countryside on Schedule 1 of the Greenbelt Plan. Towns/Villages are a Settlement Area and are governed by the policies of section 3.4 of the Greenbelt Plan. Section 3.4.3 notes that areas designated as Towns/Villages are not subject to the policies of the Greenbelt Plan with the exception of specific sections of the Greenbelt Plan. One of these, section 3.2.6, relates to external connections and provides recommendations for protections of urban river valleys.

3.0 BACKGROUND DATA COLLECTION

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

- Land Information Ontario database;
- Natural Heritage Information Centre database;
- Online Atlas Data; and,
- Aquatic species at risk distribution maps

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

3.1 LIO Natural Features Summary

Based on the MNRF Land Information Ontario (LIO) geographic database, the following features were identified on, or adjacent to, the Subject Lands (**Figure 2**, **Appendix A**):

- West Credit River Provincially Significant Wetland Complex; and,
- Woodlands.

No other known natural heritage features were identified on or adjacent to the Subject Lands. Within the broader local area, the following features were identified:

- Greenbelt Protected Countryside.

3.2 NHIC Database

The Natural Heritage Information Centre (NHIC) database (MNRF 2017a) was searched for records of provincially significant plants, vegetation communities and wildlife on, and in the vicinity of the Subject Lands. The database provides occurrence data by 1 km^2 area squares, with three squares overlapping at least a portion of the Subject Lands (17NJ7445, 17NJ7446, 17NJ7546). Within these squares, the search revealed two records:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
    - Gypsy Cuckoo Bumble Bee (*Bombus* bohemicus), listed as an S1S2 species; and,
    - Eastern Wood-Pewee (*Contopus virens*), listed as Special Concern on the SARO list.

3.3 Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas (OBBA) contains detailed information on the population and distribution status of Ontario birds (Cadman et al. 2007). The data is presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17NJ74). It should be noted that the Subject Lands are a small component of the overall bird atlas square, and therefore it is unlikely that all bird species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in bird species presence and use.

A total of 118 species were recorded in the atlas squares that overlap with the Subject Lands, with the following species of interest noted:

- Species listed as Threatened or Endangered on the SARO list:
  - Barn Swallow (*Hirundo rustica*);
  - Bank Swallow (*Riparia riparia*);
  - Bobolink (*Dolichonyx oryzivorus*); and,
  - Eastern Meadowlark (*Sturnella magna*).

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
  - Canada Warbler (*Cardellina canadensis*);
  - Chimney Swift (*Chaetura pelagica*);
  - Eastern Wood-Pewee;
  - Grasshopper Sparrow (*Ammodramus savannarum*); and,
  - Wood Thrush (*Hylocichla mustelina*)

3.4 Ontario Reptile and Amphibian Atlas

The Ontario Reptile and Amphibian Atlas contains detailed information on the population and distribution status of Ontario herpetofauna (Ontario Nature 2017). The data is presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17NJ74). It should be noted that the Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all herpetofauna species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in herpetofauna species presence and use.

A total of 17 species was recorded in the atlas squares that overlap with the Subject Lands, of which three are salamander species, eight are frog and toad species, two are turtle species and four are snake species. Of these species, the following species of interest are noted:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species):
  - Snapping Turtle (*Chelydra serpentina*); and,
  - Western Chorus Frog (*Pseudacris maculata*).

3.5 Ontario Butterfly and Moth Atlases

The Ontario Butterfly and Moth Atlases (Toronto Entomologists' Association 2018a, 2018b) contain detailed information on the population and distribution status of Ontario butterflies and moths. The data is presented on 100 km^2 area squares with one square overlapping a portion of the Subject Lands (17NJ74). It should be noted that the Subject Lands are a small component of the overall atlas square, and therefore it is unlikely that all butterfly and moth species are found within the Subject Lands. Habitat type, availability and size are all contributing factors in butterfly and moth species presence and use.

Of the species identified, the following species of interest are noted:

- Species of Conservation Concern (i.e., listed as Special Concern on the SARO list, or identified as an S1-S3 species); and,

- West Virginia White (*Pieris virginiensis).*

3.6 Fisheries and Oceans Canada Review

Aquatic species-at-risk distribution mapping (DFO 2017a) was reviewed to identify any known occurrences of aquatic species at risk, including fish and mussels, within the subwatershed where the Subject Lands are located. The Subject Lands are located on Map 10 (Ontario South West). DFO's Aquatic Species at Risk Distribution 2017 Open Maps Data Viewer (DFO 2017b) was also reviewed.

No aquatic species-at-risk were identified on, or within, 120 m of the Subject Lands or within the subwatershed.

3.7 Information Request Form Response (MNRF)

The MNRF Guelph District Information Request Form requesting the SAR and natural heritage features on, and adjacent to, the Subject Lands was submitted on June 24, 2016. A response letter was received on July 7, 2016.

The MNRF noted that there are no Species-at-Risk records for the area. However, based on the characteristics of the site, MNRF noted that there are several species-at-risk that have the potential to be present, including:

- Little Brown Myotis (*Myotis lucifugus*), listed as Endangered on the SARO list,
- Northern Myotis (*Myotis septentrionalis*), listed as Endangered on the SARO list,
- Tri-Coloured Bat (*Perimytois subflavus*), listed as Endangered on the SARO list; and,
- Butternut (*Juglans cinerea*), listed as Endangered on the SARO list.

3.8 CVC Communication

Savanta provided CVC with a draft work plan for the Scoped EIS on May 18, 2016. A response via phone discussion was received that finalized the work plan on May 26, 2016.

In the fall of 2016, a staking of the outer limits of the Town of Erin Greenland/CVC. Regulated features on site (woodlands, wetlands, watercourse). The staking occurred on November 11, 2016, with the staking results sent to CVC on December 23, 2016.

Follow-up meetings to discuss the proposed development plan for the site have also occurred through 2017 and 2018.

CVC correspondence is included in **Appendix C**.

4.0 DATA COLLECTION APPROACH AND METHODS

Scoped ecological investigations were completed on the Subject Lands in 2016 and 2017. These field investigations included Ecological Land Classification (ELC) and botanical inventory, amphibian call-count surveys, bat acoustic monitoring, breeding bird surveys, aquatic habitat assessment, and installation of piezometers. The surveys and dates, the protocols used and findings are outlined below.

4.1 Vegetation and ELC Methods

Vegetation communities were first identified on aerial imagery and then verified in the field during a summer 2017 and a spring 2018 site investigation. Vegetation community types were confirmed, sampled and revised, if necessary, using the sampling protocol of the ELC for Southern Ontario (Lee at al. 1998). ELC was completed to the finest level of resolution (Vegetation Type) where feasible. Species names generally follow nomenclature from the Flora Ontario – Integrated Botanical Information System (FOIBIS; Newmaster and Ragupathy 2012).

The provincial status of all plant species and vegetation communities is based on NHIC (MNRF 2017a). Identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 9 or 10 general exhibit a high degree of fidelity to a narrow range of habitat parameters.

4.2 Amphibian Call-count Surveys

These surveys followed standard protocols outlined in the Great Lakes Marsh Monitoring Program (BSC 2003). Surveys were conducted on warm nights with little wind. Surveys commenced one half hour before dusk and end before midnight. Visits were 15 days apart and as per protocols. The first occurred with a minimum nighttime air temperature of 5°C, the second visit with a minimum of 10°C and the third visit with a minimum of 17°C. If noise from plane, road traffic and/or trains was present, monitoring was delayed and began during a quiet period.

Amphibian call count surveys were conducted at 7 stations on the Subject Lands. Station locations are illustrated on **Figure 3 (Appendix A)**. Each station was surveyed for three minutes and a three level call category system was used to identify the level and type of frog activity.

The standard call levels are:

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

4.3 Bat Habitat Assessment and Acoustic Monitoring

A bat habitat assessment, consisting of a snag density survey, was completed on the woodland on the Subject Lands on November 10, 2018. The surveys followed the protocols identified in the MNRF guidance document Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR,

2011), as recommended in the Significant Wildlife Habitat Technical Guide Ecoregion Criteria Schedule for Ecoregion 6E (MNRF, 2015). The protocol consisted of a transect survey through the woodland area around the existing driveway on the Subject Lands, as well as an area search of the two cultural plantations proposed for removal. Each tree with a Diameter at Breast Height (DBH) ≥ 25 cm containing suitable cavities, or peeling bark (preferred by the Tri-coloured Bat), had the following information recorded: UTM, species, DBH, approximate height, decay class, canopy cover, total number of cavities and height information for the top three cavities. Each tree was also photographed.

These results were then used to assess the quality of the area to provide bat maternity roost habitat, with areas with ≥10 cavity trees/ha determined to provide the highest quality bat maternity roost habitat in accordance with MNRF guidelines.

Bat acoustic monitoring surveys were recommended for the Subject Lands. These surveys enable, with reasonable certainty, the identification of bat species using analysis of sonographic characteristics from recordings of ultrasonic calls used by bats to echolocate.

Survey methods were developed based on professional experience and using a combination of MNRF survey guidelines as outlined in “Bats and Bat Habitats: Guidelines for Wind Power Projects” (MNRF 2011) and “MNRF Survey Protocols for Species at Risks Bats within Treed Habitats: Little Brown Myotis, Northern Myotis, and Tri-Coloured Bat” (MNRF 2017b).

Surveys to detect bat species were carried out in June 2018 and were completed using Wildlife Acoustics Song Meter SM3BAT/SM4BAT recording devices, at two locations (**Figure 3; Appendix A**) over a duration of ten consecutive evenings.

Survey stations were selected based on aerial interpretation, Ecological Land Classification (ELC) vegetation community types, and ground-truthing for suitable bat micro-habitat such as clusters of trees with peeling bark, leaf clusters, and cavities. Two stations were placed on the Subject Lands.

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

All ultrasonic recordings were filtered to eliminate recordings with high levels of noise or with no bat calls, and then further analyzed using SonoBat’s auto-classification tool. All species of bats can make calls that range in frequencies and sonogram characteristics, depending on the behavior at the time of call recording (i.e., social calls, foraging calls, feeding buzzes). Calls recorded during a bat’s search phase are the most reliable for an accurate species identification, and these calls were used preferentially to identify recorded species from the Subject Lands.

Any calls with a positive identification were manually vetted by a wildlife ecologist with training in bat species identification by sonogram. Calls can be classified as not identifiable by the program due to the high level of confidence needed when classifying recordings, quality of the calls, overlap of multiple bat calls, and/or too much environmental background noise). The four species of bats listed on the SARO list all show characteristics of high frequency calling within the search phase, and therefore are readily distinguished from most other species of bats. High frequency calls that were not identifiable to species were also manually reviewed by a wildlife ecologist with

training in bat species identification by sonogram to identify those calls with characteristics of Species at Risk bats (i.e. calls with frequencies greater than 40 kHz).

Both the NHIC (MNRF 2017a) database and the SARO list (Ontario Regulation 230/08) were reviewed to determine the current provincial status for each bat species detected.

4.5 Breeding Bird Surveys

Breeding bird surveys were conducted following protocol set forth by the Ontario Breeding Bird Atlas (Cadman et al. 2007) and the Ontario Forest Bird Monitoring Program (Cadman et al. 1998).

Surveys were conducted between dawn and 5 hours after dawn with suitable wind conditions, no thick fog or precipitation (Cadman et al. 2007). Point count stations were located in various habitat types within the Subject Lands and combined with area searches to help determine the presence, variety and abundance of bird species. A total of 5 point count stations were surveyed within the Subject Lands and are illustrated on **Figure 3 (Appendix A)**. Each point count station was surveyed for 10 minutes for birds within 100 m and outside 100 m. All species recorded on a point-count were mapped to provide specific spatial information and were observed for signs of breeding behaviour. Surveys were conducted at least 10 days apart.

During breeding bird surveys, vegetation was assessed for potential presence of Species-at-Risk habitat. As the Subject Lands contained hayfields, a third round of grassland bird surveys was included in accordance with MNRF protocols, with 3 point count stations in grassland habitat surveyed during Round 3.

Both the NHIC (MNRF 2017a) database and the SARO list (Ontario Regulation 230/08) were reviewed to determine the current provincial status for each bird species.

4.6 Aquatic Habitat Assessment

An Aquatic Habitat Assessment was completed on July 7, 2016 of the tributaries of the Credit River on the Subject Lands. The Aquatic Habitat Assessment consisted of a visual survey of existing instream and riparian habitat conditions along and adjacent to the watercourse running through the Subject lands. The assessment took note of any of any of the following features:

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

During the aquatic habitat assessment, a temperature logger was installed within each of the watercourses on the Subject Lands, and set to record hourly temperature values. The temperature loggers were then retrieved on November 11, 2016.

5.0 ENVIRONMENTAL SETTING AND CHARACTERISTICS

5.1 Physical Conditions

5.1.1 Physiography and Soils

The Subject Lands are located within the Till Moraine physiographic region of southern Ontario (Chapman and Putman 2007). Borehole investigations on the Subject Lands completed by Burnside (2018) noted that the surficial soils generally consist of 0.2 m to 1.5 m of topsoil or peat overlying sand ranging in thickness of 1.2 m to 3.8 m. Below the surficial sand are layers of silt, sandy silt and sand, with silty clay noted at depths of 1.52 m to 2.90 m. Limestone bedrock was then encountered between 5.3 and 12.2 m below ground surface.

5.1.2 Topography

The easternmost and westernmost portions of the site represent local high elevations of 430 m and 405 m above sea level, respectively, with the low areas within the site generally found across the southern property limit at approximate elevation of 395 m above sea level.

5.1.3 Surface Water Resources

The Subject Lands are located entirely within the West Credit River Subwatershed of the Credit River. The main channel of the West Credit River passes through the Town of Erin approximately 350 m east of the Subject Lands, while three tributaries of the West Credit River bisect the Subject Lands. Two of the tributaries on the Subject Lands are situated within the limits of the PSW, but are crossed by existing farm crossings.

5.2 Aquatic Ecology: Habitat Assessment and Species Occurrences

The West Credit River watershed is identified in the Credit River Fisheries Management Plan (CVC and MNR 2002) as being a coldwater fish community. Coldwater fish communities are defined in the plan as those where Brook Trout (*Salvelinus fontinalis*) are the indicator species. Species diversity within coldwater systems can be naturally very low.

Three small tributaries of the West Credit River were identified as bisecting the Subject Lands; the aquatic habitat assessment considered each tributary, shown on **Figure 4 (Appendix A)**, as discussed below.

Tributary A

This crossing is situated along the existing access laneway and was dry at the time of survey. A small corrugated steel pipe (CSP) culvert is present at this location, which is expected to convey flows under the access laneway during snow melt and high precipitation rain events. This feature is considered ephemeral.

Tributary B

A small watercourse flows southeasterly under the farm laneway through a CSP culvert, approximately 400 m north east of Eighth Line. Composed of primarily runs with short reaches of

riffle and less reaches of flats, the watercourse is shaded by deciduous forest associated with the West Credit River Wetland Complex.

The watercourse exists in a defined channel at bankfull width of 1.5 m, and at the time of survey in July 2016 had a wetted width of 0.4 m in run reaches. Riffle segments were 0.7 m wide wetted, and flats were 1.1 m wide. The channel is open and bordered by a mineral marsh with in-stream watercress immediately upstream of the laneway culvert, but otherwise meanders naturally through the woodland both upstream and downstream of the crossing.

In-stream habitat is provided by undercut banks, cobble and woody debris. In addition to cobble, substrate in this tributary is also composed of gravel and sand.

While much of the tributary is in a naturalized state, the laneway culvert is undersized, and the channel exhibits historical straightening at the laneway. Restoration opportunities exist at this location, and a larger crossing structure associated with natural channel design would improve fish passage potential at this location.

No fish were observed at the time of survey, however three species of dragonfly/damselfly were observed in the vicinity of this crossing:

- Twelve-Spotted Skimmer (*Libellula pulchella*);
- Dot-tailed Whiteface (*Leucorrhinia intacta*); and,
- Ebony Jewelwing (*Calopteryx maculata*).

Tributary C

Tributary C is located approximately 750 north east of Eighth Line, and is associated more directly with a component of the West Credit River Wetland Complex, and is crossed by an existing farm laneway. At the laneway, the wetland exists both upstream and downstream of a small CSP culvert. The culvert appears to be providing an equilibrating function rather than conveying flow, and evidence suggests historical channelization associated with installation of the culvert may have occurred.

Upstream of the crossing, within the wetland, a braided channel is associated with emergent sedges and grasses, with iron stained muck as substrate throughout. Minimal flow was observed moving through the braided system southeasterly toward the laneway crossing.

Downstream of the laneway culvert a 0.6 m deep pool exists at the culvert outlet. Beyond the pool the channel is undefined as it transitions to shallower floodplain in a cattail marsh wetland type. The marsh is approximately 30m in diameter.

No fish were observed during the survey, however Green Frog (*Rana clamitans*) adults and tadpoles were observed and heard calling at this crossing.

5.3 Terrestrial Ecology: Habitat Assessment and Species Occurrences

5.3.1 Vegetation

Ecological Land Classification

The Subject Lands consist of a mixture of woodlands (swamp and forest), and open agricultural hay fields.

ELC mapping of the Subject Lands is shown on **Figure 4 (Appendix A).** A detailed list and description of ELC units is provided in **Table 1** (**Appendix B**). No provincially rare vegetation communities were present on the Subject Lands (MNRF 2017a).

Vascular Plants

Botanical inventories completed on the Subject Lands identified a total of 208 species of vascular plants. Of that number, 158 (or 76%) are native and 50 (or 24%) are exotic. A full species list is included in **Table 2 (Appendix B).**

The majority of the native species (97%) are ranked S5 (secure in Ontario), and five species (3%) are ranked S4 (apparently secure in Ontario; MNRF 2017a). Four regionally rare plants were observed, as per the Flora of Wellington County rarity rankings (Frank et al. 2009). None of the regionally rare species are considered rare in Ontario. None of the species recorded from the Subject Lands had a co-efficient of conservation value of 9 or 10. No Species at Risk plants were observed on the Subject Lands.

MNRF Evaluated Wetlands / Provincially Significant Wetlands (PSW)

The Land Information Ontario (LIO) database was accessed to determine if any PSWs or MNRF evaluated wetlands occur on, or adjacent to, the Subject Lands. The results of this search show that the West Credit River PSW Complex is present on the Subject Lands, and adjacent to it. This wetland was classified as provincially significant in 2011, with boundary updates applied since then. Following the staking of the portions of the wetland in 2016 with CVC, additional updates to the wetland limits were identified and communicated to MNRF.

Invasive Species

The weediness index, ranging from -1 (low) to -3 (high) quantifies the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance (Oldham et al. 1995). While most species deemed to be exotic to Ontario have a weediness index value, some do not. Of the 50 exotic species present on the Subject Lands, 47 have a weediness index assigned by Oldham et al. (1995). Seventeen percent (or eight) of these species have an index of -3. Although this number is not high for a study area of this size, two species were commonly observed in certain parts of the Subject Lands. These species were Common Buckthorn (R*hamnus cathartica*) and Scotch Pine (*Pinus sylvestris*). Scotch Pine was the dominant canopy tree in two plantations (CUP3-3), Common Buckthorn was the dominant shrub in the plantation understories. These two plantations show limited signs of naturalization by native species, due (in part) to the competitive nature of Common Buckthorn and Scotch Pine.

5.3.2 Wildlife

Amphibians

A cumulative total of 4 amphibian species were recorded during the AMC assessments, with an additional species recorded incidentally during other surveys on the Subject Lands. Detailed results of the AMC surveys are provided in **Table 3 (Appendix B)**. All of the amphibian species are provincially ranked S5 (common and secure) or S4 (apparently common and secure).

Bats

Bat Habitat Assessment

The bat habitat assessment around the existing driveway identified 10 suitable cavity trees. As the area investigated was approximately 1 ha in size, the woodland community in this area is determined to meet the habitat criteria for candidate bat maternity colony habitat.

The bat habitat assessment of the cultural plantations determined that these features did not contain suitable trees for bat maternity colony habitat.

Bat Acoustic Monitoring

Six bat species were confirmed to be present within the woodlands: Big Brown Bat *(Eptesicus fuscus),* Silver-haired Bat *(Lasionycteris noctivagans),* Hoary Bat *(Lasiurus cinereus*), Eastern Red Bat (*Lasiurus borealis*), Little Brown Myotis *(Myotis lucifugus),* and Small-footed Myotis (*Myotis leibii)*.

Of the recorded calls that were identifiable to species, 93% were confirmed to be Big Brown Bat, 3% were confirmed to be Silver-haired Bat, 1.5% were confirmed as Hoary Bat, with each of the remaining species detected at less than 1% of the calls (i.e. fewer than 10 calls detected).

Two species recorded are listed on the SARO List: Little Brown Myotis and Small-footed Myotis are listed as Endangered and therefore, individuals and their habitat are protected under the provincial *Endangered Species Act, 2007.* The Myotis individuals were recorded at both detector stations.

Breeding Bird Surveys

A total of 39 bird species were observed within the Subject Lands. Of this total, one species was confirmed, seven are probable and 25 are possible breeders on the Subject Lands. The remaining six bird species are considered non-breeders, flyovers or migrants. The observed breeding bird species are discussed below. All species observed on the Subject Lands are listed in **Table 4 (Appendix B).**

A total of 33 (100%) of the confirmed, probable or possible breeders are provincially ranked S5 (common and secure), S4 (apparently common and secure) or SNA (species not native to Ontario). None of the identified bird species are considered provincially rare (S1-S3; MNRF 2017a).

The following Species at Risk were observed on the Subject Lands:

- Eastern Wood-Pewee; and,
- Barn Swallow

Eastern Wood-Pewee were recorded singing within two of the woodlands which occur at least partially on the Subject Lands; these communities are treated as probable breeding habitat.

Barn Swallow were observed foraging over the Subject Lands; however no evidence of nesting was noted within the one structure that is present near the existing access laneway, and they are likely nesting on adjacent properties within the local area.

Insects

There were 18 butterfly and 13 dragonfly species recorded on the Subject Lands (included in **Table 5, Appendix B**). 31 (100%) species observed are provincially ranked S5 (common and secure), S4 (apparently common and secure) or SNA (species not native to Ontario). Monarch (*Danaus plexippus*) were identified on the Subject Lands, and are listed as being of Special Concern on the SARO list. Milkweed, the host plant for Monarch eggs, were observed during surveys on the Subject Lands, though not noted as abundant within the hayfields on the Subject Lands.

6.0 ANALYSIS OF ECOLOGICAL AND NATURAL HERITAGE SIGNIFICANCE

The PPS defines 8 types of significant natural heritage features, as follows:

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

In order to help assess how natural heritage features are defined and how they relate to land development proposals, the MNRF has prepared a technical guidance document, the NHRM. The following sections provide a detailed discussion regarding the designation as defined by the NHRM and whether they apply to the above noted features on the Subject Lands. Also included in this section is an assessment of the regionally and locally important species found on the Subject Lands. Note that significant coastal wetlands are not applicable to the Subject Lands or adjacent lands.

6.1 Significant Wetlands

Within Ontario, Significant Wetlands (i.e., PSWs) are identified by the MNRF or by their designates. Other evaluated or unevaluated wetlands may be identified for conservation by the municipality or the conservation authority.

As noted previously, the wetlands on and surrounding the Subject Lands are considered to be components of the West Credit River PSW Complex (**Figure 2**, **Appendix A**).

6.2 Significant Woodlands

Significant woodlands are defined and designated by the planning authority using criteria established by the MNRF.

The Town of Erin Official Plan notes that the Core Greenlands or Greenlands designation may also include upland woodlands over 10 ha in area that are considered significant by the County of Wellington. The Official Plan also recognizes that smaller woodlands may be of local significance. The County of Wellington Official Plan notes that within the Urban System, such as the urban centre of Erin, all woodlands greater than 1 ha in size are considered to be significant woodlands.

All woodland communities on/adjacent to the Subject Lands are greater than 1 ha in size and are therefore considered to be significant woodlands by the County of Wellington's crtieria. In addition, as the majority of the woodland communities are associated with the West Credit River PSW complex and associated tributaries, the woodland communities would also be expected to meet significant criteria identified within the NHRM.

6.3 Habitat of Endangered and Threatened Species

Endangered and Threatened species are identified by the Committee on the Status of Species at Risk in Ontario (COSSARO), using criteria, which generally follow those in use by the federal government and at a global scale by the IUCN.

During the surveys completed on the Subject Lands, three species listed as Threatened or Endangered on the SARO list were identified: Barn Swallow, Eastern Small-footed Myotis and Little Brown Myotis.

As noted previously within section 5, it was determined that Barn Swallow are not breeding on the Subject Lands, and use of these areas is currently restricted to aerial foraging. As Barn Swallows are known to forage over both rural and developed areas, foraging habitat is generally not regulated by the MNRF, and therefore this habitat type is not present on the Subject Lands.

With respect to the occurrences of species at risk bats, the number of calls recorded was generally low (at less than 10 over the monitoring period), and may be considered indicative of incidental use of the feature. However, a conservative approach will be taken whereby the woodland community will be considered to provide habitat for SAR bats.

6.4 Fish Habitat

Fish habitat, as defined in the federal Fisheries Act, c. F-14, means spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes. Fish, as defined in S.2 of the Fisheries Act, c. F-14, includes parts of fish, shellfish, crustaceans marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals (Fisheries and Oceans Canada 2013).

Though fisheries studies have not been completed on the Subject Lands, the Tributaries B and C of the West Credit River noted on the Subject Lands are considered to be fish habitat per the PPS.

6.5 Significant Wildlife Habitat

SWH is one of the more complex natural heritage features to identify and evaluate. There are several provincial documents that discuss identifying and evaluating SWH including the NHRM (MNR 2010), the Significant Wildlife Habitat Technical Guide (MNRF 2000), and the Final SWH Ecoregion Criterion Schedule (MNRF 2015). The Subject Lands are located in Ecoregion 6E and were therefore assessed using the 6E Criterion Schedule (MNRF 2015).

There are four general types of SWH including seasonal concentration areas of animals, rare or specialized habitats, habitat for species of conservation concern, and animal movement corridors. These habitat types are addressed below, with the full assessment provided in **Table 6 (Appendix B)**.

6.5.1 Seasonal Concentration Areas of Animals

Seasonal concentration areas of animals are those sites where large numbers of a species gather together at one time of the year, or where several species congregate. The following is a partial list of numerous examples: deer yarding areas, bat hibernacula, waterfowl stopover or staging area, turtle wintering areas, raptor wintering area, shorebird migrator stopover areas and colonially nesting bird breeding habitat. Areas that support a SAR, or if a large proportion of the population may be lost if the habitat is destroyed, are examples of seasonal concentration areas which should be designated as significant.

Of these feature types, surveys on the Subject Lands confirmed presence of significant bat maternity colony habitat associated with the FOD5-7 community along the existing laneway. It is assumed that the SWD and other FOD communities present on and adjacent to the Subject Lands also provide this habitat type.

In addition, two types of significant wildlife habitat will be carried forward to the impact assessment, though not confirmed during wildlife surveys. The first, turtle over-wintering habitat, is associated with off-site ponds that could not be assessed due to property access. The second, raptor wintering areas, are associated primarily with off-site meadows.

6.5.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Rare Vegetation Communities

Rare vegetation communities are considered designated as rare in the province by SRANKS. SRANKS are rarity rankings applied to species at the ‘state’, or in Canada at the provincial level, and are part of a system developed under the auspices of the Nature Conservancy (Arlington, VA). Generally, community types with SRANKS of S1 to S3 (extremely rare to rare-uncommon in Ontario), as defined by the NHIC, could qualify. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered important.

All vegetation communities identified, delineated and assessed within the Subject Lands are considered common in Ontario. None of the identified vegetation communities are considered rare in Ontario.

Specialized Habitat for Wildlife

Specialized habitat for wildlife are microhabitats that are critical to some wildlife species, including for example, woodland raptor nesting habitat, turtle nesting areas or amphibian breeding habitat.

Of these types of wildlife habitat, only one was confirmed. Seeps and springs are present within the woodland communities on and adjacent to the Subject Lands.

6.5.3 Habitat for Species of Conservation Concern

Generally, species of conservation concern include those species listed as S1 to S3 or SH by SRANKS. Habitats of species of conservation concern do not include habitats of Endangered or Threatened species as identified by the ESA. Endangered and threatened species are discussed in section 6.3.

Two of the woodland communities on the Subject Lands were identified as breeding habitat for Eastern Wood-Pewee, while the aforementioned off-site ponds are considered to be candidate habitat for Snapping Turtle.

6.5.4 Animal Movement Corridors

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

Based on information collected, the Subject Lands do not provide movement corridor for deer wintering areas or between amphibian breeding and summering habitat.

6.5.5 Significant Wildlife Habitat Summary

Based on the above discussions, the following significant wildlife habitat features will be carried forward to the impact assessment discussion:

- Candidate raptor wintering areas associated with the cultural meadow/thicket communities and the woodlands;
- Candidate turtle over-wintering habitat/Snapping Turtle habitat associated with off-site ponds; and,
- Confirmed bat maternity colony habitat, seeps and springs and Eastern Wood-Pewee habitat associated with the forest and swamp communities.

6.6 Areas of Natural and Scientific Interest

An ANSI is an area identified by the MNRF as having provincially or regionally significant representative geological or ecological features. There are no ANSIs identified on or adjacent to the Subject Lands.

6.7 Significant Valleylands

Significant valleylands are defined and designated by the planning authority. General guidelines for determining significance of these features are presented in the NHRM (MNR 2010) for section 2.1 of the PPS. Recommended criteria for designating significant valleylands include prominence as a distinctive landform, degree of naturalness, and importance of its ecological functions, restoration potential, and historical and cultural values.

No valleyland features were identified on the Subject Lands, and therefore significant valleylands are not considered to be present.

6.8 Summary of Ecological and Natural Heritage Significance

An analysis of existing natural heritage features on the Subject Lands was completed.

The results of this analysis identified the following provincial and local natural heritage features as present, in whole or in part, on, or within 120 m, of the Subject Lands:

- Significant wetlands;
- Significant woodlands;
- Fish habitat;
- Habitat for endangered species (SAR bats); and,
- Significant Wildlife habitats, including,
    - Candidate raptor wintering areas associated with the cultural meadow/thicket communities and the woodlands;
    - Candidate turtle over-wintering habitat/Snapping Turtle habitat associated with off-site ponds; and,
    - Confirmed bat maternity colony habitat, seeps and springs and Eastern Wood-Pewee habitat associated with the forest and swamp communities.

7.0 DESCRIPTION OF DEVELOPMENT PROPOSAL

The proposed development for the Subject Lands is comprised of 33 lots of low density estate development, as shown in **Figure 5** (**Appendix A**). The development will occur along a single roadway, with cul-de-sacs at the eastern and western ends, and a road connection between Lots 5 and 6 south to Forest Ridge Road. A 6.0m wide emergency access road is proposed between Lot 26 and the property limit to connect to the existing water tower access road.

The primary road will require two crossings of tributaries of the West Credit River on the Subject Lands. The crossing of Tributary B is planned via a culvert, while the crossing of Tributary C will occur through a 30 m long span bridge structure designed to avoid direct encroachment into the riparian wetland at this location. Existing farm crossings at these locations will be removed, and restoration undertaken where appropriate.

The road between Lots 6 and 7 has been designed to follow the existing farm land between two units of the West Credit River PSW Complex. Due to the narrow opening in this location, grading associated with the roadway will directly abut a portion of the wetland as shown in Figure 4 (Appendix A), while some tree removal along the edge of the staked dripline of the significant woodland will also be required. Burnside has proposed the use of a Non-Standard Municipal Right-of-Way design to minimize the width of the roadway to the greatest extent possible.

Beyond the road crossing between Lots 6 and 7, an average 10 m buffer from the staked limits of the wetland/woodlands on the Subject Lands has been incorporated into the design, with the following identified exceptions that are proposed by the design team for efficient lot design:

- Southwestern corner of Lot 1 - encroachment into the buffer and approximately 0.1 ha of the feature associated with screening plantings connected to the significant woodland along the rear of the existing residence;
- Northeastern corner of Lot 6 - encroachment into the buffer and approximately 0.01 ha of the feature where a narrow corner of trees extends from the woodland community;
- Eastern limit of Lot 12 - encroachment into the buffer where another portion of significant woodland extends into the agricultural lands;
- Rear limits of Lots 23 and 24 - encroachment into the buffer and and approximately 0.1 ha of the feature where an area of young successional woodland extends from the coniferous forest community; and,
- Rear Limits of Lots 32 and 33 – encroachment into the buffer and feature where two trees that are connected by dripline to the forest community, but are located within the agricultural lands, are present.

Given the large size of the identified estate lots, efforts will be made to retain trees potentially impacted within the areas identified above as a component of the lot.

In addition, the development plan proposes to remove the two cultural plantations that form components of the significant woodlands on the Subject Lands. To offset these removals, a planting plan is proposed at the rear of Lots 13 to 16, and Lots 21 to 23 to improve connectivity amongst the various features of the significant woodland community.

As municipal sanitary sewer services are not available in this area, wastewater servicing will be provided via privately owned individual onsite sewage systems that are designed in accordance

with Ministry of the Environment Conservation and Parks (MECP) and Town of Erin standards, and the Ontario Building Code.

Grading on the Subject Lands has been designed to mimic existing pre-development conditions as feasible, however there are minor changes in drainage patterns expected (Burnside 2018). Low Impact Development (LID) measures have been proposed to control the quantity of stormwater discharge to pre-development levels. Burnside (2018) currently contemplates inclusion of two infiltration trenches on each lot to control roof runoff, while a bio-retention cell is proposed in the centre of the north-eastern cul-de-sac. Each of the LID measures will be sized to hold and infiltrate the 25 mm event. Quality control of road/driveway runoff will be provided through vegetation filtration within the roadside ditch network, and within the natural vegetation communities at the point of discharge to provide 80% removal of total suspended solids (TSS). The incorporation of LID measures will also assist in maintaining the water balance across the site.

Burnside (2018) notes that a detailed Erosion and Sediment Control Plan will be prepared as a component of the detailed design.

8.0 IMPACT ASSESSMENT, AVOIDANCE AND MITIGATION MEASURES

This section of the EIS assesses the potential effects on the identified natural heritage features, and their functions, that could occur over the short-term and long-term following implementation of the development plan. It also suggests appropriate mitigation measures to limit negative impacts and/or to enhance features and functions where practical.

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

For purposes of this evaluation, we have provided the assessment concisely within **Table 7** (below). The following summarizes the results of the impact assessment information presented in **Table 7**.

8.1 Fish Habitat

Fish habitat was confirmed present within the local area, associated with Tributaries B and C of the West Credit River on the Subject Lands.

8.1.1 Potential Impacts During Construction

Potential impacts on fish habitat in the identified watercourses could occur due to both direct and indirect impacts during construction:

- Direct Impacts:
  - Construction activities associated with the proposed watercrossings

- Indirect Impacts:
  - Erosion and sedimentation from the construction area;
  - Effects due to stormwater management during construction; and,
  - Accidental spills (e.g., of contaminated soils, or fuel or oil from machinery) with transport of spilled material to the watercourses.

Direct Impacts

As previously identified, two crossings of tributaries of the West Credit River are proposed that provide fish habitat. Installation of road/pedestrian water crossing structures across the tributaries on the Subject Lands could potentially result in a number of temporary and permanent effects on fish and fish habitat. Temporary effects could include:

- Disturbance to fish and fish habitat during installation of water crossing structures; and,
- Temporary loss of habitat during the crossing structure installation process.

The primary mitigation measure to prevent adverse effects on fish due to in-water construction is adherence to in-water timing restriction windows specified by the MNRF. These state that to protect the reproductive periods of the respective fish species, in-water works in southern Ontario

TABLE 7: Predicted Effects, Mitigation, Enhancement and Net Effects

NATURAL HERITAGE FEATURES AND ASSOIATED FUNCTIONS	SIGNIFICANT CHARACTERISTICS AND SENSITIVITY	IMPACTOR	PREDICTED EFFECTS	AVOIDANCE MITIGATION AND/OR RESTORATION	NET EFFECTS	MONITORING AND MANAGEMENT
PPS NATURAL HERITAGE FEATURES						
1. Fish Habitat	• Fish habitat was confirmed to be present within the local area, associated with Tributaries B and C of the West Credit River on the Subject Lands.	• Earthworks (e.g., grading, filling) and vegetation removal on the Subject Lands during construction of the development could potentially result in increased quantity and decreased quality (due to increased suspended solids, increased temperature) of surface water runoff from the Subject Lands during storm events • Potential increased surface water runoff quantity, impaired runoff quality, altered runoff locations and decreased groundwater infiltration during post-construction • During construction, spills can occur from equipment and vehicles that could enter into the tributary, impairing water quality and aquatic and riparian vegetation • Installation of road/pedestrian water crossing structures across the tributaries on the Subject Lands could potentially result in a number of temporary and permanent effects on fish and fish habitat. • Work site isolation measures will likely be required to dewater the work area, minimize in-water work requirements and facilitate proper installation of the structures. This could consist of dam and pump operations or various other types of bypass systems.	• Disturbance to fish and fish habitat during installation of water crossing structures • Temporary loss of habitat during the crossing structure installation process. • Temporary disturbance outside of reproductive periods would be expected to cause fish to leave the zone of impact, if present, and may temporarily alter local foraging and habitat use. However, this should only occur over a relatively short duration time frame when work is occurring in water. • Temporary restrictions in movements and some minor density dependant effects due to fish avoidance of work areas and increases in density in residual habitats, • Effects on fish movements (e.g., creation of full or partial barriers to upstream movement) • Loss or alteration of fish habitat within the footprint of the watercourse crossing structure. • Indirect effects on fish habitat could occur due to potential for erosion and sedimentation from the disturbed work area during construction • More specifically, during storm events, stormwater runoff from the construction area resulting in increased amount of stormwater and decreased water quality, primarily	• Tributary B is recommended to be crossed by either an open span culvert or a closed culvert with substrates placed on the culvert invert, that spans the bankfull width of the watercourse. Tributary C will be crossed by a span bridge. • The primary mitigation measure to prevent adverse effects on fish due to in-water construction is adherence to in-water timing restriction windows specified by the MNRF. These state that to protect the reproductive periods of the respective fish species, in-water works in southern Ontario should not be conducted between October 1 and May 31 for coldwater watercourses, such as those on the Subject Lands. • A fish rescue program should be implemented prior to completion of work site isolation to ensure that fish are safely removed to suitable habitats in the vicinity of the work site. • Should dewatering be necessary prior to fish removal, screening should be present around the pump inlet to prevent fish mortality due to impingement and/or entrainment. • An erosion and sediment control plan will be required • The erosion and sedimentation control measures will be installed prior to construction, or prior to the element of work, which may cause the effect • During construction, the contractor will have spill kits on site, manage spills	• As both watercourses are currently constrained by existing farm crossings, it is anticipated that installation of properly designed crossing structures will result in improvements for both fish movement and habitat at the water crossings. • Mitigation measures to be implemented during construction are anticipated to be effective to prevent indirect effects on fish habitat due to erosion and sedimentation, stormwater runoff and accidental spills • Based on the stormwater management plan and preliminary water balance, long term effects on water quantity and quality in the watercourse are anticipated to be mitigated	• A Monitoring Program will be developed and adhered to during construction to monitor any required works within the watercourse, and to ensure that the ESC measures are installed correctly and maintained in good working order throughout construction and removed after exposed soils are established with vegetation

			due to suspended sediments, entering the watercourse • Work site isolation systems may result in temporary loss of habitat within the dewatered work area • Increased stormwater flows could result in erosion of the bed and banks of the tributaries • Increased erosion from the Subject Lands or within the tributaries itself could result in negative effects on fish habitat (e.g., infilling of interstitial spaces in gravelly riffles) and mortality, health effects or altered behaviour of aquatic biota (benthic invertebrates and fish) • During construction, water quality and vegetation could be negatively affected due to spills • Changes in water quality due to stormwater discharge (e.g. increased total suspended solids and/or increased temperature) could have negative impacts on fish and fish habitat • Decreases in groundwater infiltration could potential result in decreased baseflow, with impacts on fish habitat	accordingly, and report spills to the appropriate MECP Spills Action Centre, if applicable • The stormwater management system has been designed to maintain stormwater quantity discharge to below existing levels, while ensuring 80% TSS removal to ensure water quality • Pre- and post-construction water balance will be maintained through the use of Low Impact Development Measures (LID)		
2. Significant Wetlands	• Wetlands on the Subject Lands are considered components of the West Credit River PSW Complex	• Encroachment into the 10 m buffers • Effects due to stormwater management during construction • Accidental spills (e.g., fuel or oil from machinery) with transport of spilled material to watercourses. • Erosion and sedimentation from the construction area; • No requirement for construction within the West Credit River PSW Complex on the Subject Lands. Following construction of the crossing of Tributary C of the West Credit River PSW Complex, the existing farm crossing through the riparian wetland associated with this crossing will be removed. (See Fish Habitat discussion above)	See Fish Habitat discussion above	• See Fish Habitat discussion above with respect to mitigation measures relating to erosion and sediment, stormwater management and accidental spills. • Mitigation measures to be employed during the removal of the farm crossing will be determined with Credit Valley Conservation as a component of the permit to minimize the impact to the greatest extent possible. • Enhanced sediment and erosion controls be placed at Lots 6, 7 and 12 where encroachment into the buffers occurs to ensure that the wetlands are protected from impacts during the construction phase • Construction monitoring at Lots 6, 7 and 12 should also be enhanced to	• An overall benefit to the wetland community will be obtained by increasing the wetland surface area at the location of the former crossing.	See Fish Habitat discussion above

				ensure that any deficiencies are identified as soon as possible. • Educational materials be prepared for new residents to ensure they are aware of the importance of the natural areas surrounding the Subject Lands and the potential impacts that ad-hoc access, dumping, or pet intrusion into these areas may cause.		
3. Significant Coastal Wetlands	• Not applicable	N/A	N/A	N/A	N/A	N/A
4. Habitat of Endangered and Threatened Species	• The woodland on the Subject Lands provides habitat for Little Brown Myotis and Eastern Small-footed Myotis	• Minor removal of edge trees providing bat maternity colony habitat will be required.	• Extent of removal required would not be anticipated to have a measurable impact on use of these features given the large areas of these communities.	• Prior to any removals a targeted survey of any trees slated for removal will be undertaken to assess potential for provision of bat habitat features. • Where possible, construction activities will be timed outside of the nighttime and early morning periods during the bat breeding seasons (typically May through July).	• Potential for minor removal of bat habitat trees. Should suitable bat habitat trees be identified, consultation will be undertaken with MNRF to permit removal of the trees in accordance with the requirements of the Endangered Species Act, 2007. If required, an overall benefit would be provided for the species.	Should suitable bat habitat trees be identified, consultation will be undertaken with MNRF to permit removal of the trees in accordance with the requirements of the Endangered Species Act, 2007, which would be anticipated to include a requirement for monitoring.
5. Significant Woodlands	• The forest communities on the Subject Lands are considered to be a significant woodland	• Removal of the two Scotch Pine cultural plantations (approximately 0.6 ha) that overlap with Lots 9 through 15.. • Minor removal of trees along the edge of the woodland to support the installation of the connecting roadway from Lots 6 to 7. • Minor removal of trees in Lots 1, 6, 23, 24, 32 and 33. In general, these areas where narrow projections of the woodlands extend into the agricultural lands, or where individual mature trees within the agricultural lands with intersecting canopies.	• Loss of woodland vegetation form the Subject Lands.	• To offset tree removals (both proposed and assumed), tree planting will occur in open areas around the site on a 1:1 basis to replace trees removed to support the development. This will primarily occur at the rear of Lots 13 to 16, and Lots 21 to 23.	• Net benefit to woodland communities anticipated through improved connectivity and replacement of communities of introduced species with native species.	Monitoring will be undertaken in years 1 to 5 following planting to ensure successful establishment of planted stock.
6. Significant Valleylands	Not present	N/A	N/A	N/A	N/A	N/A
7. Significant Areas of Natural and Scientific Interest	• No ANSIs were identified on or adjacent to the Subject Lands.	N/A	N/A	N/A	N/A	N/A

8. Significant Wildlife Habitat	• The woodlands and the cultural meadow/thicket communities on the Subject Lands have been identified as candidate raptor wintering areas • Candidate turtle over-wintering habitat/Snapping Turtle habitat associated with off-site ponds adjacent to the Subject Lands • Confirmed bat maternity colony habitat, seeps and springs and Eastern Wood-Pewee habitat associated with the forest and swamp communities.	• Minor removal of edge trees providing the Eastern Wood-Pewee and bat maternity colony habitat will be required. • Indirect impact on the significant wildlife habitats may occur due to noise disruption of wildlife communities both during and following construction	• Extent of removals required would not be anticipated to have a measurable impact on use of these features given the large areas of these communities. • Disturbance effects are not anticipated given the large size of the natural areas, the proposed low density residential built form, and the common occurrence of identified species around urban development.	• Prior to any removals a targeted survey of any trees slated for removal will be undertaken to assess potential for provision of bat habitat features. • Where possible, construction activities will be timed outside of the nighttime and early morning and evening periods during the bat and bird breeding seasons (typically May through July). • Education materials will be provided to homeowners to minimize ad-hoc intrusions into the natural features providing these habitat types during the post-construction phase.	• No measurable impact on use of the features by the target wildlife species is anticipated given the minor nature of the removals.	None required.

should not be conducted between October 1 and May 31 for coldwater watercourses, such as those on the Subject Lands.

Adherence to these timing restrictions will ensure that any disturbance that does occur will not affect critical fish reproductive processes (e.g., spawning, egg incubation and fry emergence). Though no fish were observed at the time of baseline investigations, temporary disturbance outside of reproductive periods would be expected to cause fish to leave the zone of impact, if present, and may temporarily alter local foraging and habitat use. However, this should only occur over a relatively short duration time frame when work is occurring in water.

Work site isolation measures will likely be required to dewater the work area, minimize in-water work requirements and facilitate proper installation of the structures. This could consist of dam and pump operations or various other types of bypass systems. These types of work site isolation systems would result in temporary loss of habitat within the dewatered work area, but assuming adherence to in-water work timing restrictions, this temporary loss of habitat would not affect critical reproductive processes. This may cause temporary restrictions in movements and some minor density dependant effects due to fish avoidance of work areas and increases in density in residual habitats, but no significant long-term effects are anticipated. A fish rescue program should be implemented prior to completion of work site isolation to ensure that fish are safely removed to suitable habitats in the vicinity of the work site. Should dewatering be necessary prior to fish removal, screening should be present around the pump inlet to prevent fish mortality due to impingement and/or entrainment.

Permanent effects on fish and fish habitat due to water crossing structures could include:

- Effects on fish movements (e.g., creation of full or partial barriers to upstream movement); and,
- Loss or alteration of fish habitat within the footprint of the structure.

As both watercourses are currently constrained by existing farm crossings, it is anticipated that installation of properly designed crossing structures will result in improvements for both fish movement and habitat at the water crossings. With respect to the crossing of Tributary B of the West Credit River, it recommended that the crossing be completed using either an open span culvert or a closed culvert with substrates placed on the culvert invert, and should span the bankfull width of the watercourse.

Once detailed designs of water crossings structures are available, it is recommended that they be reviewed to determine if there is potential to cause serious harm to fish, and if so, the project should be forwarded to DFO for review to determine the requirements under the *Fisheries Act*.

Indirect Impacts

Indirect impacts on fish habitat could potentially occur as a result of erosion from the work area with associated sedimentation in watercourses, water management practices during construction and accidental spills. Each of these is discussed in the following sections.

<u>Erosion and Sedimentation</u>

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

Burnside's FSR (2018) recommends preparation of a detailed Erosion and Sediment Control Plan during detailed design. Currently, they propose prior to grading, a temporary sediment control fence will be placed around the perimeter of all areas that will be disturbed. In addition, sediment traps, gravel mud mats at access points, and sediment control ponds will be installed as needed. Route inspection and maintenance will be required during and immediately following construction to ensure the erosion and sediment control measures are maintained until such time as the site has stabilized.

All measures of the detailed plan should be developed based on the guidance provided in the Erosion and Sediment Control Guideline for Urban Construction (GGHCA 2006).

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

Stormwater Management During Construction

Increases in stormwater runoff from the disturbed areas of the construction site may have the effect of increasing erosion from the Subject Lands, or increasing flows to the tributaries of the West Credit River resulting in additional bed and bank erosion with associated potential effects on fish and fish habitat.

It is recommended that the contractor consider management of stormwater throughout the construction period as part of the overall ESC Plan, since stormwater flows through disturbed areas are one of the primary causes of erosion and sedimentation from construction sites.

Accidental Spills

Accidental spills of potentially hazardous materials (e.g., contaminated soils, fuel and oil from heavy equipment, etc.) could cause stress or injury to fish and other aquatic biota (e.g., benthic invertebrates).

In order to mitigate the potential for adverse effects due to accidental spills during construction, it is recommended that the contractor prepare a spill prevention and response plan to outline the material handling and storage protocols, mitigation measures (e.g., spill kits on-site), monitoring measures and spill response plans (i.e., emergency contact procedures, including MECP Spills Action Centre, and response measures including containment and clean-up). Implementation of an effective spill prevention and response plan is expected to be effective in preventing adverse effects on the tributaries of the West Credit River.

8.1.2 Potential Post-Construction Impacts

No direct impacts on the aquatic environment are anticipated to occur during the post-construction period, since there would be no requirement for any activity within fish habitat (i.e., below the average annual high-water mark of any watercourses providing fish habitat).

However, several potential indirect impacts on the aquatic environment may occur during the post-construction period including:

- Changes in flow and water quality due to stormwater management and changes in groundwater infiltration; and,
- Effects on water quality associated with runoff from urban areas.

These potential impacts and recommended mitigation measures are discussed in the following sections.

Stormwater Management and Changes in Infiltration

The main potential long-term impact on the aquatic environment due to the presence of the proposed development would be potential changes in flows and water quality within the tributaries of the West Credit River due to stormwater management practices, as well as increased imperviousness and decreased infiltration of surface water into the ground.

As noted in Section 7, Burnside (2018) noted in their FSR that the development has been designed to incorporated LIDs that will provide stormwater quantity controls to restrict flows to pre-development levels, or lower.

As the development plan proposes a low-density built form, the extent of impervious surface will be lower than in higher-density developments. However, there will be an increase in impervious areas. LID measures identified in the FSR will allow for maintenance of water balance across the development.

Impacts on Water Quality

The proposed stormwater management system, as described in the FSR, has been designed to provide for 80% removal of TSS on an annual basis, which will mitigate potential effects on water quality in the West Credit River due to suspended sediments and turbidity.

Some surface water on the Subject Lands will infiltrate through residential lawns/infiltration trenches and into the shallow groundwater flowing towards the tributaries of the West Credit River. This runoff or infiltration water could potentially be impaired due to residential use of potential contaminants (e.g., lawn fertilizers) or other residential land use activities (including accidental spills in rear yards). Given the low density nature of the development that has been proposed, sources of contamination will be somewhat limited. Educational materials will be provided to new homeowners within the development to ensure they are aware of the sensitivity of the natural environmental features in this area.

8.2 Significant Wetlands

This section discusses the potential impacts of the proposed development during the construction and post-construction periods on the components of the West Credit River PSW Complex that are present on the Subject Lands.

8.2.1 Potential Impacts During Construction

Potential impacts on wetlands during construction include:

- Direct Impacts
  - Construction requirements for removal of the existing farm crossing of Tributary C

- Indirect Impacts
  - Encroachment into the 10 m buffers
  - Erosion and sedimentation from the construction area;
  - Effects due to stormwater management during construction; and,
  - Accidental spills (e.g., fuel or oil from machinery) with transport of spilled material to watercourses.

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

Direct Impacts During Construction

There will be no requirement for construction within the West Credit River PSW Complex on the Subject Lands. However, following construction of the crossing of Tributary C of the West Credit River PSW Complex, the existing farm crossing through the riparian wetland associated with this crossing will be removed. As the wetland directly abuts this crossing, removal of the crossing is likely to require some work within the wetland community. However, an overall benefit to the wetland community will be obtained by increasing the wetland surface area at the location of the former crossing.

Mitigation measures to be employed during the removal of the crossing will be determined with Credit Valley Conservation as a component of the permit to minimize the impact to the greatest extent possible.

Indirect impacts during Construction

Indirect impacts could potentially include erosion from the work area with associated sedimentation in watercourses, water management practices during construction and accidental spills. Mitigation measures with respect to these potential impacts have been previously identified in section 7.1.1 in respect of fish habitats; the measures identified therein would be effective at mitigating impacts on the significant wetland communities.

Encroachment into the 10 m buffer from the wetlands have been proposed. As noted in section 7, these are predominantly associated with the road crossings between Lots 6 and 7, as well as over Tributary C of the West Credit River. The encroachment into the buffer at the eastern limit of Lot 12 may also bring the lot line within 10 m of the limits of the wetland, though this would occur within proposed open space on the lot as shown in **Figure 5 (Appendix A).** It is recommended that enhanced sediment and erosion controls be placed in these locations where encroachment occurs to ensure that the wetlands are protected from impacts during the construction phase.

Monitoring at these locations should also be enhanced to ensure that any deficiencies are identified as soon as possible.

8.2.2 Potential Post-Construction Impacts

No direct impacts associated with maintenance of the development on the PSW are anticipated to occur during the post-construction period, since there would be no requirement for any activity within the feature.

Outside of the roadway between Lots 6 and 7, and the crossing of Tributary C, a 10 m buffer has generally been implemented from the limits of the wetland communities, with the exception of the eastern limit of Lot 12. The proposed 10 m buffer will ensure that critical root zones of individual trees along the edge of the wetland communities are protected from potential impacts during construction. The 10 m buffer will also enhance the feature through restoration of natural self-sustaining vegetation on lands that have been maintained in agricultural production. The buffer will also provide some measure of protection against direct impacts resulting from ad-hoc access to the feature from neighbouring residents and pets, however the key preventative measures in this regard will be education of new landowners. To this end, it is proposed that educational materials be prepared for new residents to ensure they are aware of the importance of the natural areas surrounding the Subject Lands and the potential impacts that ad-hoc access, dumping, or pet intrusion into these areas may cause. Where encroachment into the 10 m buffers are required, it is recommended that enhanced (i.e., higher density) plantings occur to provide additional protection of the wetland communities.

In addition to the direct impacts, several potential indirect impacts on the PSW may occur during the post-construction period including:

- Changes in flow and water quality due to stormwater management; and,
- Effects on water quality associated with runoff from urban areas.

These potential impacts and recommended mitigation measures have been primarily addressed in section 8.1.2 in respect of fish habitat.

8.3 Significant Woodlands

This section discusses the potential impacts of the proposed development during the construction and post-construction periods on the significant woodland community.

8.3.1 Potential Impacts During Construction

Direct impacts on the significant woodland community are proposed. This will include:

- Removal of the two cultural plantations (approximately 0.6 ha) that overlap with Lots 9 through 15. These communities are dominated by Scotch Pine with abundant Common Buckthorn in the understory.
- Minor removal of trees along the edge of the woodland to support the installation of the connecting roadway from Lots 6 to 7.

- Minor removal of trees in Lots 1, 6, 23, 24, 32 and 33. In general, these areas where narrow projections of the woodlands extend into the agricultural lands, or where individual mature trees within the agricultural lands with intersecting canopies.

Efforts will be made to retain trees identified as within lot lines as rear yard trees. However, as these trees will be located on private land, they will be treated as if they have been removed. To offset these removals (both proposed and assumed), tree planting will occur in open areas around the site on a 1:1 basis to replace trees removed to support the development. This will primarily occur at the rear of Lots 13 to 16, and Lots 21 to 23. Planting within these areas will provide an overall benefit to the significant woodland communities through replacement on non-native species with a diverse native species community and improving connectivity within the greater Natural Heritage System surrounding the development area.

Indirect impacts on the significant woodlands may also occur during the construction phase associated with work within the critical root zones of the trees along the edge. It is recommended that a tree protection plan be prepared to mitigate the potential for damage to the trees. This will be of particular importance during the construction of the roadway between Lots 6 and 7. It is recommended that a certified arborist be on hand during any tree removal and construction in this area to ensure that impacts on the remnant trees are minimized.

8.3.2 Potential Post-Construction Impacts

Direct impacts on the significant woodland communities are not anticipated to be required to support the development post-construction. As with significant wetland discussed in Section 8.2.2, the proposed 10 m buffer will provide benefit to the significant wetland community. Additional mitigation measures identified in Section 8.2.2 will also be effective at preventing impacts on significant woodlands due to ad-hoc access.

8.4 Significant Wildlife Habitat/Habitat of Endangered Species (SAR bats)

The woodland communities on the Subject Lands were determined to provide habitat for endangered SAR bats. In addition, the following significant wildlife habitats were identified on the Subject Lands:

- Candidate raptor wintering areas associated with the cultural meadow/thicket communities and the woodlands;
- Candidate turtle over-wintering habitat/Snapping Turtle habitat associated with off-site ponds; and,
- Confirmed bat maternity colony habitat, seeps and springs and Eastern Wood-Pewee habitat associated with the forest and swamp communities.

The only potential direct impacts on these habitat types will be associated with the construction of the roadway between Lots 6 and 7. Some minor removal of edge trees providing the Eastern Wood-Pewee and bat maternity colony habitat will be required. The extent of removal required would not be anticipated to have a measurable impact on use of these features given the large areas of these communities. Prior to any removals a targeted survey of any trees slated for removal will be undertaken to assess potential for provision of bat habitat features. Should suitable bat habitat trees be identified, consultation will be undertaken with MNRF to permit

removal of the trees in accordance with the requirements of the Endangered Species Act, 2007. As a result, no negative impact from direct impacts is anticipated during construction.

The predominant indirect impact on the significant wildlife habitats may occur due to noise disruption of wildlife communities both during and following construction.

Where possible, construction activities will be timed outside of the nighttime and early morning periods during the bat and bird breeding seasons (typically May through July). Some localized movement of wildlife out of these communities may still occur during the construction phase, however given the large size of the natural features, this would not generally be expected to be a significant effect.

As noted previously, education materials will be provided to homeowners to minimize ad-hoc intrusions into the natural features providing these habitat types during the post-construction phase. In addition, the low density nature of the development would be expected to result in reduced disturbance in comparison to other built forms. Given the large size of the natural features in this area, there would be no measurable impact on use of the significant wildlife habitat anticipated from disturbance during the post-construction phase.

9.0 CONCLUSION AND RECOMMENDATIONS

This EIS has been developed as part of the planning process for Homes in the Hills' proposed residential development on the Subject Lands.

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

The proposed development occurs in areas that are predominantly agricultural, with removal of two small cultural plantations proposed, as well as some minor vegetation removal from a significant woodland to support the road connection and proposed lot fabric on the Subject Lands.

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

- The agricultural lands upon which the majority of the development is proposed, do not provide habitat for any significant natural features;

- The majority of significant natural features are associated with the large expanses of woodland/wetland communities on and adjacent to the Subject Lands. These include; significant woodlands, West Credit River PSW Complex, fish habitat associated with tributaries of the West Credit River, habitat for endangered species (SAR bats) and significant wildlife habitats, including confirmed bat maternity colony habitat, seeps and springs and Eastern Wood-Pewee habitat;

- Outside of these areas, and off of the Subject Lands, the following significant wildlife habitats were identified:

    - Candidate raptor wintering areas associated with the cultural meadow/thicket communities and the woodlands; and,
    - Candidate turtle over-wintering habitat/Snapping Turtle habitat associated with off-site ponds.

- An average 10 m buffer has been proposed along the staked limit of the woodland/wetland communities identified on the Subject Lands, where possible. Removal of two cultural plantations comprised predominantly of non-native species that are considered to be a component of the significant woodlands is proposed. Additional removals will also be required to support the road crossing between Lots 6 and 7, and have been proposed for certain lots to support the proposed lot alignment. Compensation for woodland removals are proposed on a 1:1 area basis; identified planting locations will improve connectivity between the woodland communities in the local landscape, and will replace the non-native species of the cultural plantation with native species;

- Two watercourse crossings will be required, one of which will be a culvert, the second of which will be a 30 m span bridge. As existing farm crossings are present at both of these locations, and overall improvement in aquatic habitat conditions is anticipated following installation of these measures. Restoration works are proposed in association with the farm lane removal following installation of the span bridge;

- Burnside's FSR has demonstrated that they will control stormwater to meet both quantity and quality control requirements, thereby preventing impacts on fish habitat in the receiving tributaries of the West Credit River. In addition, Low Impact Development Measures have been proposed to maintain water balance across the Subject Lands;

- LID measures are also proposed for to ensure water balance to the tributaries of the West Credit River and associated wetland communities;

- A formal Erosion and Sediment Control Plan will be provided as part of the detailed design phase of the Project. The plan will demonstrate how the construction activities will avoid and mitigate impacts to the tributaries of the West Credit River and associated wetland communities of the West Credit River PSW Complex;

- The use of standard mitigation measures regarding the use of fuels and chemicals during the construction process will reduce the risk of groundwater or surface water contamination from accidental spills. Storage of materials should be at least 30 m from any watercourse; and

- Educational materials are recommended for distribution to homeowners to ensure they are aware of the sensitivity of the natural features in the local area, and to promote environmental stewardship through prevention of letting domestic animals enter these areas, and avoiding dumping/trespassing within the communities.

Based upon current and available technical information and analyses, the predicted effects on the natural features and associated functions will be avoided/minimized through the protection, mitigation and enhancement measures recommended and discussed in this report. Where direct impacts have been identified, compensation measures are proposed that are expected to provide an overall benefit to the natural environment. These proposed mitigation and compensation measures will maintain important natural features and associated functions, replace non-native components of a woodland with a native community, and restore impacted wetland areas.

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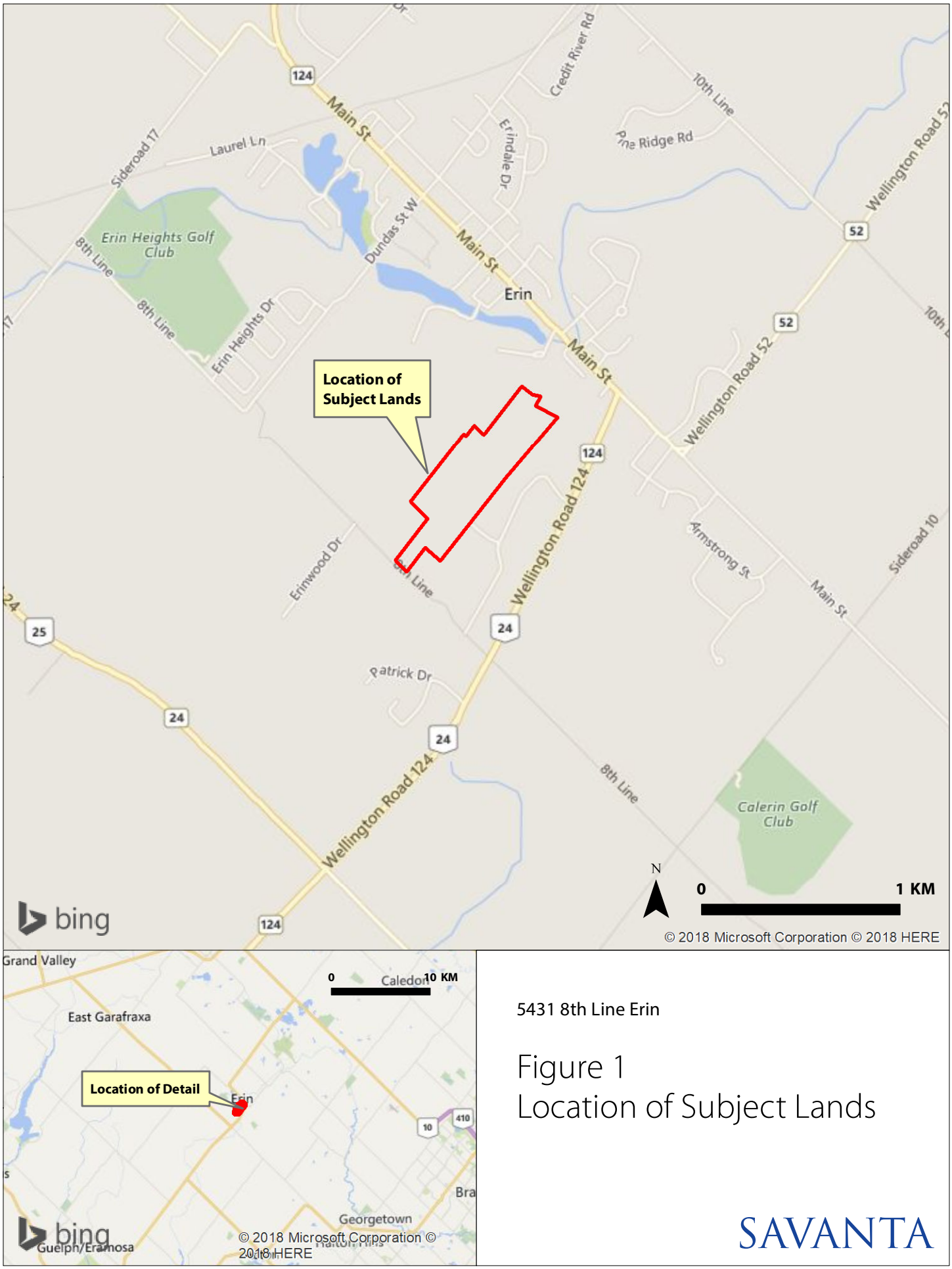
APPENDICES

Appendix A – Figures



5431 8th Line Erin

Figure 1
Location of Subject Lands

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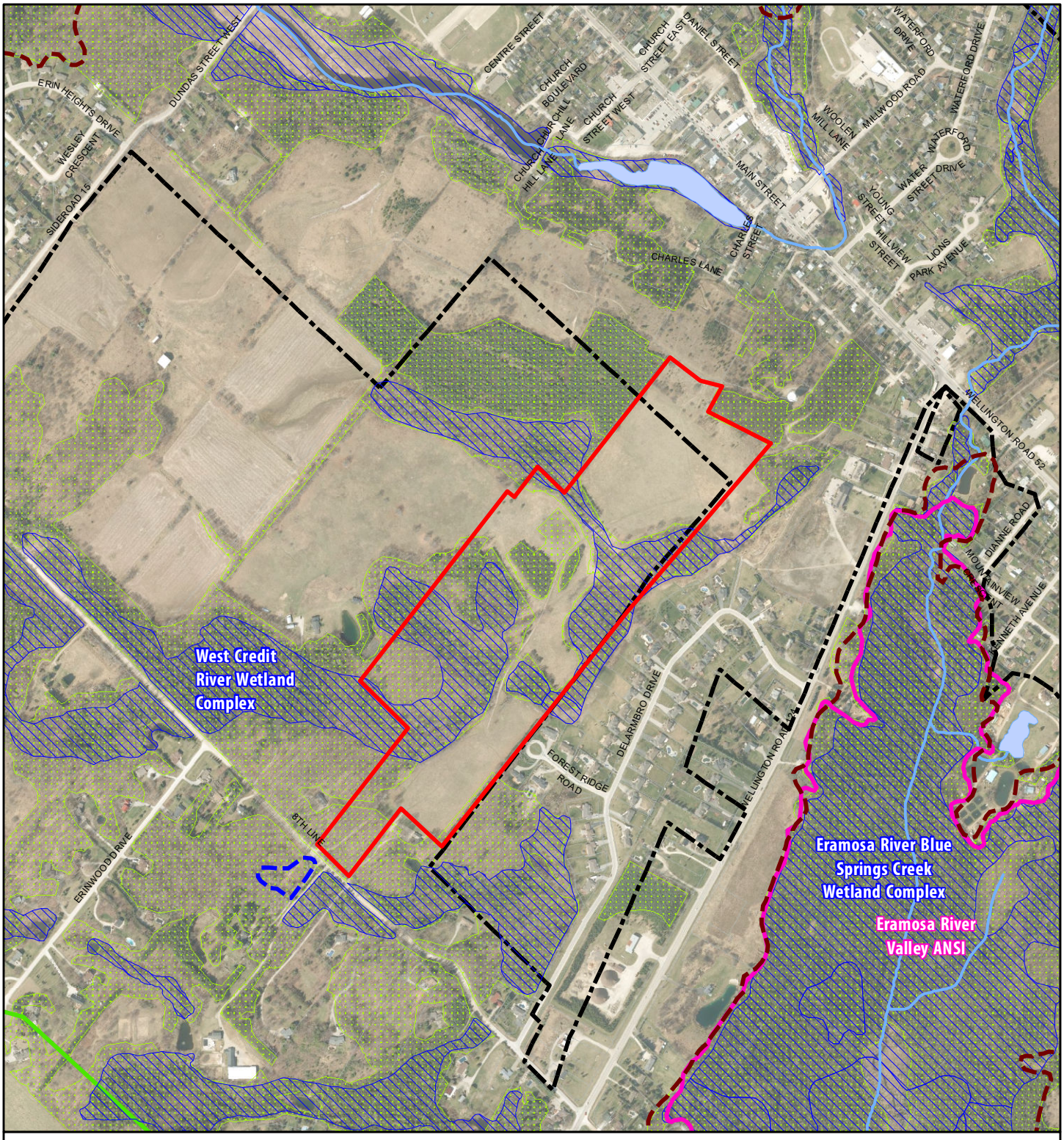

5431 8th Line Erin

Figure 2 Natural Heritage Features

0 0.5 KM

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- Sujbject Lands
- ANSI (MNRF LIO)
- Watercourse (MNR LIO)
- Waterbody (MNRF LIO)
- Wetland Evaluated-Provincial (MNRF LIO)
- Wetland not evaluated per OWES (MNRF LIO)
- Woodland (MNRF LIO)
- Deer Wintering Area (MNRF LIO)
- Greenbelt Protected Countryside
- Greenbelt Towns and Villages

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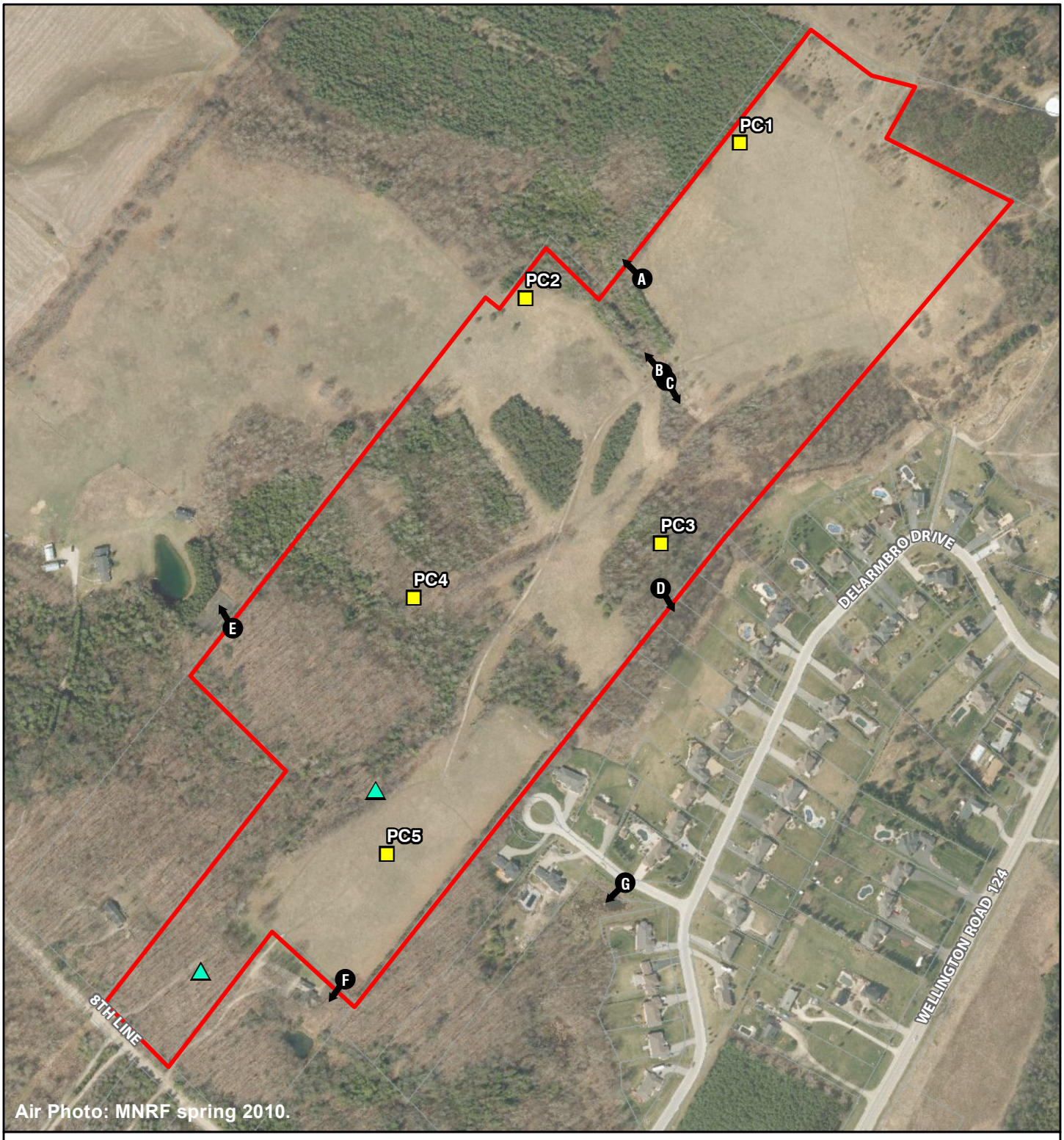

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Figure 3
Baseline Environmental Monitoring Locations

- Subject Lands
- Acoustic Bat Monitoring Station
- Amphibian Call Count Station
- Breeding Bird Point Count Station

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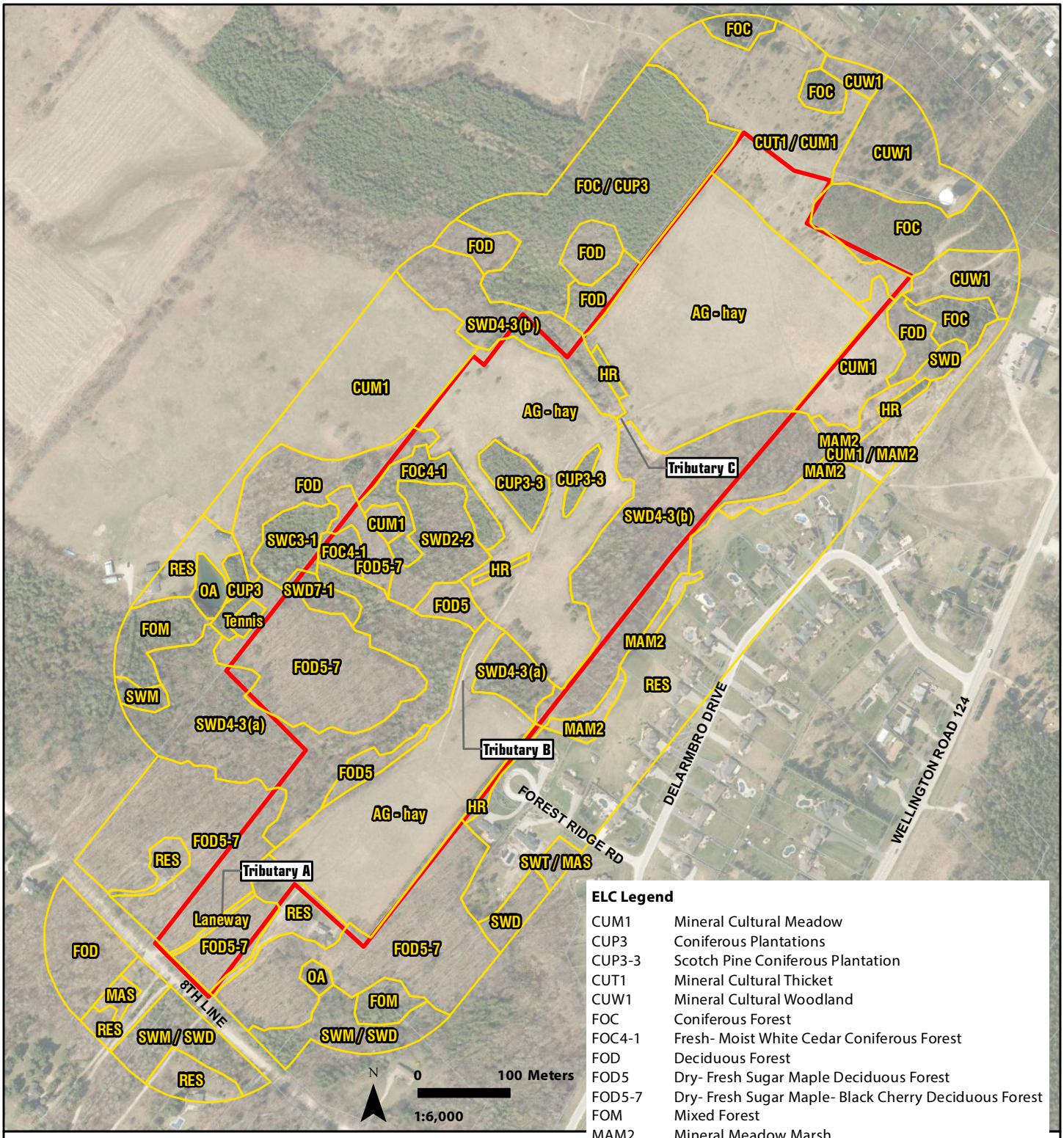

ELC Legend

CUM1	Mineral Cultural Meadow
CUP3	Coniferous Plantations
CUP3-3	Scotch Pine Coniferous Plantation
CUT1	Mineral Cultural Thicket
CUW1	Mineral Cultural Woodland
FOC	Coniferous Forest
FOC4-1	Fresh- Moist White Cedar Coniferous Forest
FOD	Deciduous Forest
FOD5	Dry- Fresh Sugar Maple Deciduous Forest
FOD5-7	Dry- Fresh Sugar Maple- Black Cherry Deciduous Forest
FOM	Mixed Forest
MAM2	Mineral Meadow Marsh
MAS	Shallow Marsh
SWC3-1	White Cedar Organic Coniferous Swamp
SWD	Deciduous Swamp
SWD2-2	Green Ash Mineral Deciduous Swamp
SWD4-3(a)	White Birch Poplar Mineral Deciduous Swamp
SWD4-3(b)	White Birch Poplar Mineral Deciduous Swamp
SWD7-1	White Birch- Poplar Organic Deciduous Swamp
SWM	Mixed Swamp
SWT	Thicket Swamp

AG	Agricultural	OA	Open Aquatic
HR	Hedgerow	RES	Residential
Laneway	Laneway	Tennis	Tennis

5431 8th Line Erin

Figure 4 Ecological Land Classification

Subject Lands

Ecological Land Classification

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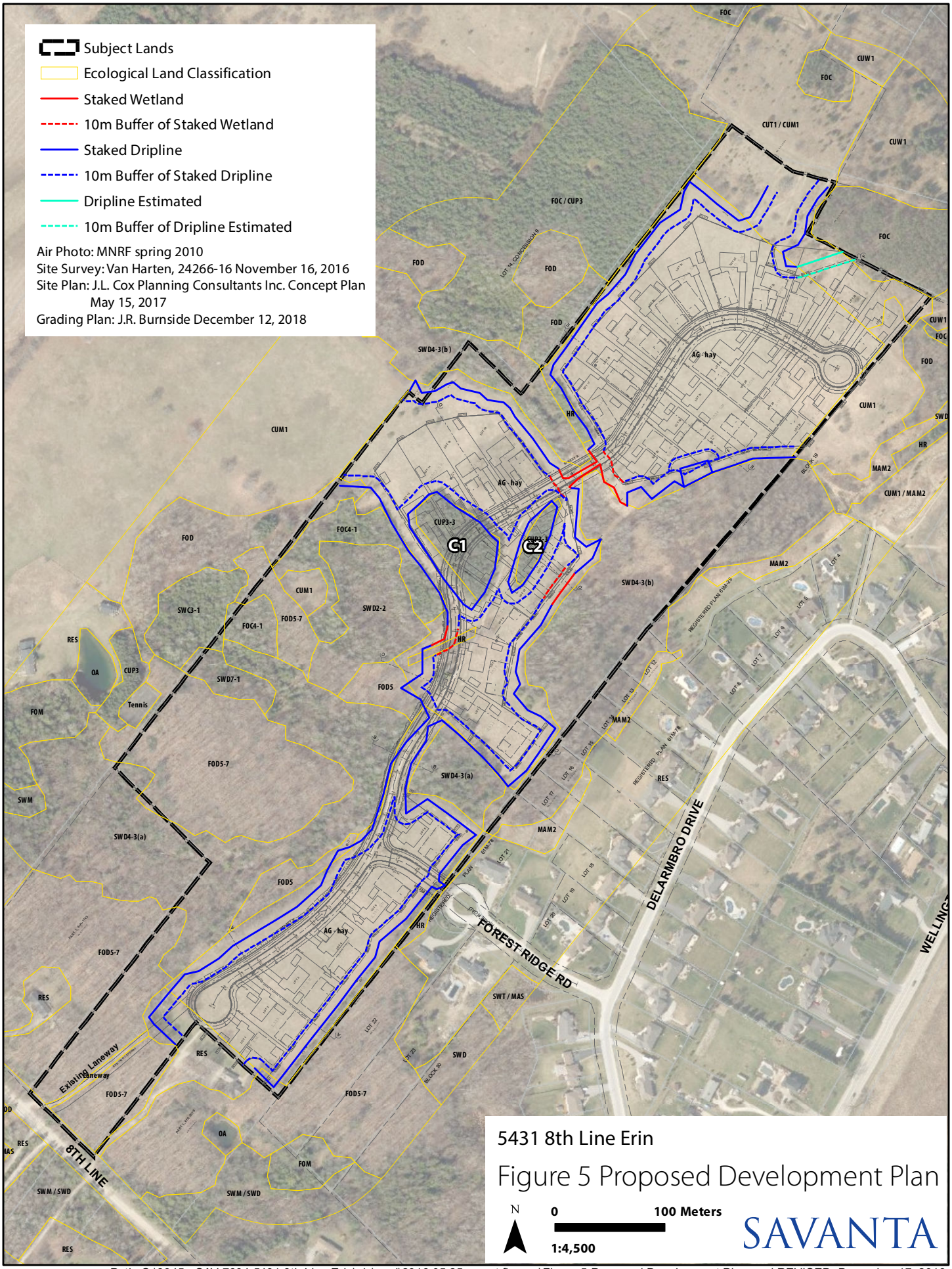
Air Photo: MNRF spring 2010.



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Appendix B – Tables

Table 1: Ecological Landscape Characterization (ELC) Community Descriptions

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC, 2013)
FOREST		
Coniferous Forest		
FOC4-1 Fresh-moist White Cedar Coniferous Forest	• Dense, mid-age canopy dominated by White Cedar (*Thuja occidentalis*), with infrequent occurrences of trembling aspen • Understory sparsely composed of young Green Ash (*Fraxinus pennsylvanica*) • Ground cover also sparse, with infrequent observation of Common Helleborine (*Epipactis helleborine*) • Soil texture was a silty very fine sand with mottles starting at a depth of 35cm; soil moisture regime was 5.	S5
Deciduous Forest		
FOD5 Dry-fresh Sugar Maple Deciduous Forest	• Mature forest with abundance of Sugar Maple (*Acer saccharum ssp. saccharum*), and varying abundance of Black Cherry (*Prunus serotina*), Green Ash, and American Basswood (*Tilia americana*) • Understory often composed of canopy saplings, as well as Choke Cherry (*Prunus virginiana*), and Alternate-leaved Dogwood (*Cornus alternifolia*) • Ground cover generally consisted of Enchanter's Nightshade (*Circaea lutetiana*), Herb Robert (*Geranium robertianum*), White Avens (*Geum canadense*), and Graceful Sedge (*Carex gracillima*)	S5
FOD5-7 Dry-fresh Sugar Maple – Black Cherry Deciduous Forest	• Mature forest with abundance of Sugar Maple and occasional occurrences of Black Cherry; sub-canopy also inclusive of American Basswood, American Beech (*Fagus grandifolia*), and Eastern Hemlock (*Tsuga canadensis*) • Understory composed of canopy/sub-canopy saplings, as well as Choke Cherry, Prickly Gooseberry (*Ribes cynosbati*), Alternate-leaved Dogwood, and Cranberry Viburnum (*Viburnum opulus*) • Ground cover with high diversity overall; species often including Enchanter's Nightshade, Blue Cohosh (*Caulophyllum thalictroides*), Wild Lily-of-the-valley (*Maianthemum canadense*), White Baneberry (*Actaea pachypoda*), Spinulose Wood Fern (*Dryopteris carthusiana*), False Solomon's Seal (*Maianthemum racemosum*), Bladder Sedge (*Carex intumescens*), and Drooping Wood Sedge (*Carex arctata*) • Soil texture was silty very fine sand with mottles starting at a depth of 60 cm; the soil moisture regime was 3.	S5
CULTURAL		
Cultural Plantation		
CUP3-3 Scotch Pine Coniferous	• Mature plantation with canopy dominated by Scotch Pine (*Pinus sylvestris*) • Understory had abundance of Common Buckthorn (*Rhamnus cathartica*), with infrequent saplings (White Cedar and Green Ash)	Not ranked

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC, 2013)
Plantation	• Ground cover generally consisted of Canada Goldenrod (*Solidago canadensis*), Common Hempnettle (*Galeopsis tetrahit*), English Plantain (*Plantago lanceolata*), Climbing Nightshade (*Solanum dulcamara*), and Kentucky Bluegrass (*Poa pratensis ssp. pratensis*) • Soil texture was loam with very fine sand; no mottles were observed at a depth of 35cm	
Cultural Meadow		
CUM1 Mineral Cultural Meadow	• Open meadows, generally dominated by forb species intermixed with graminoids • Composition often included Black-eyed Susan (*Rudbeckia hirta*), Wild Carrot (*Daucus carota*), Self-heal (*Prunella vulgaris ssp. vulgaris*), Daisy Fleabane (*Erigeron hyssopifolius*), Virginia Strawberry (*Fragaria virginiana*), Yarrow (*Achillea millefolium*), and Kentucky Bluegrass.	Not ranked
Cultural Thicket		
CUT1 / CUM1 Mineral Cultural Thicket / Mineral Cultural Meadow	• Relatively open shrub / sapling thicket with pockets of open meadow • Canopy species composition and density varies, but often includes Scotch Pine, Common Apple (*Malus pumila*), English Hawthorn, young Black Cherry, and young White Ash (*Fraxinus americana*) • Ground cover often composed of Awnless Brome (*Bromus inermis*), Wild Carrot, Canada Bluegrass (*Poa compressa*), Yarrow, and Spotted Knapweed (*Centaurea stoebe*). • Substrate with areas of exposed cobble; occurs on south-facing slope.	Not ranked
Cultural Woodland		
CUW1 Mineral Cultural Woodland	• Similar species composition to that of the CUT1 / CUM1 but successionally more advanced • Young to mid-age canopy composed of Scotch Pine, Common Apple, English Hawthorn, Black Cherry, and White Ash • Ground cover often composed of Awnless Brome, Wild Carrot, Canada Bluegrass, Yarrow, and Spotted Knapweed. • Substrate with areas of exposed cobble; occurs on south-facing slope.	Not ranked
SWAMP		
Coniferous Swamp		
SWC3-1 White Cedar Organic Coniferous Swamp	• Mid-age canopy composed of White Cedar, with infrequent occurrences of Trembling Aspen (*Populus tremuloides*) and Yellow Birch (*Betula alleghaniensis*) • Understory was generally sparse, consisting only of White Cedar • Ground cover was sparse in some areas, but often included Porcupine Sedge (*Carex hystericina*), Enchanter's Nightshade, Climbing Nightshade, Bebb's Sedge (*Carex bebbii*), and Marsh Bedstraw (*Galium palustre*) • Soil texture was organic (humic) to a depth of 50cm	S5

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC, 2013)
	• No surface water was observed; ground water was noted at 40cm depth	
Deciduous Swamp		
SWD2-2 Green Ash Mineral Deciduous Swamp	• Canopy composed of young Green Ash, with occasional White Elm (*Ulmus americana*). Less common associate species also included Black Walnut (*Juglans nigra*), Balsam Poplar (*Populus balsamifera*), and White Cedar • Ground cover generally consisted of Swamp Aster (*Symphyotrichum puniceum var. puniceum*), Spotted Joe-pye-weed (*Eutrochium maculatum var. maculatum*), Field Horsetail (*Equisetum arvense*), Corn Mint (*Mentha arvensis*), Rice Cut Grass (*Leersia oryzoides*), Crested Sedge (*Carex cristatella*), and Bebb's Sedge • Soil texture was silty very fine sand with mottles starting at a depth of 18cm; the soil moisture regime was 6. • No surface or ground water was observed	S5
SWD4-3 (a) White Birch – Poplar Mineral Deciduous Swamp	• Mature canopy generally composed of Trembling Aspen and Green Ash, with infrequent occurrences of White Elm, Yellow Birch, and Balsam Fir (*Abies balsamea*) • Understory species often consisted of young canopy species, with infrequent Red-osier Dogwood (*Cornus sericea*), Riverbank Grape (*Vitis riparia*), and Common Elderberry (*Sambucus canadensis*) • Ground cover often included Fowl Meadow Grass (*Glyceria striata*), Sensitive Fern (*Onoclea sensibilis*), Field Horsetail, Enchanter's Nightshade, Lady Fern (*Athyrium filix-femina),* Spotted Jewelweed (*Impatiens capensis*), and Hairy Willow-herb (*Epilobium ciliatum ssp. ciliatum*). • Effective soil texture was fine sand with mottles starting at a depth of 10cm, and gley observed at 15cm; the moisture regime was 6 • Surface water was confined to a stream that flowed through the community.	S5
SWD4-3 (b) White Birch – Poplar Mineral Deciduous Swamp	• Mature canopy generally composed of Trembling Aspen, Balsam Poplar, and White Elm • Understory species often consisted of young canopy species, with occasional Red-osier Dogwood, Heart-leaved Willow (*Salix eriocephala*), Wild Black Currant (*Ribes americanum*), and Inserted Virginia-creeper (*Parthenocissus inserta*) • Ground cover generally consisted of Rough-leaf Goldenrod (*Solidago rugosa*), Smooth Goldenrod (*Solidago gigantea*), Sensitive Fern, Field Horsetail, Spotted Joe-pye-weed, and Reed Canary Grass (*Phalaris arundinacea var. arundinacea*). • Soil texture was fine sand with mottles starting at a depth of 20cm; the soil moisture regime was 6 • Surface water was confined to a stream that flowed through the community.	S5
SWD7-1 White Birch – Poplar Organic Deciduous Swamp	• Mid-age canopy composed of Trembling Aspen, Black Walnut, Balsam Fir, and less commonly, White Cedar and Yellow Birch • Understory generally composed of young White Cedar, young Black Ash, and Red-osier Dogwood • Ground cover often with abundance of Fowl Meadow Grass, and occasional occurrences of Marsh Fern (*Thelypteris palustris*), Rough-leaf Goldenrod, Spotted Jewelweed, Awl-fruited Sedge (*Carex stipata*), and Porcupine Sedge	S5

ELC TYPE	COMMUNITY DESCRIPTION	S-RANK / G-RANK (NHIC, 2013)
	• Soil texture was organic (humic) down to 90cm, where sandy clay and gley were observed • No surface water was observed, though ground water was noted at a depth of 28cm below soil surface. A potential seep was observed at UTM 17 574882, 4845859 (organic soil was saturated at the surface).	
Thicket Swamp		
SWT2-5 Red-osier Mineral Thicket Swamp	• Canopy composed of approximately 50% cover of Red-osier Dogwood, with infrequent poplar trees protruding above • Ground cover generally consisted of Reed Canary Grass, Sensitive Fern, Field Horsetail, Rough-leaf Goldenrod, Spotted Joe-pye-weed, Fox Sedge (*Carex vulpinoidea*), and Woolly Sedge (*Carex pellita*) • Soil texture was fine sand with mottles starting at a depth of 20cm; soil moisture regime was 6 • Surface water was confined to a stream that flowed through the community.	S5

*****Denotes a type not listed in the Southern Ontario ELC Guide

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PTERIDOPHYTES	**FERNS and ALLIES**												
Dennstaedtiaceae	**Bracken Fern Family**												
Pteridium aquilinum	Bracken Fern	2	3		S5			G5		X	X	X	(L.) Kuhn
Dryopteridaceae	**Wood Fern Family**												
Athyrium filix-femina	Lady Fern	4	0		S5			G5			X	X	(L.) Roth ex Mert.
Cystopteris bulbifera	Bulblet Fern	5	-2		S5			G5		X	X	X	(L.) Bernh.
Dryopteris carthusiana	Spinulose Wood Fern	5	-2		S5			G5		X	X	X	(Vill.) H.P. Fuchs
Dryopteris cristata	Crested Wood Fern	7	-5		S5			G5		X	X	X	(L.) A. Gray
Dryopteris intermedia	Evergreen Wood Fern	5	0		S5			G5		X	X	X	(Muhlenb. ex Willd.) A. Gray
Dryopteris marginalis	Marginal Wood Fern	5	3		S5			G5		X	X	X	(L.) A. Gray
Onoclea sensibilis	Sensitive Fern	4	-3		S5			G5		X	X	X	L.
Equisetaceae	**Horsetail Family**												
Equisetum arvense	Field Horsetail	0	0		S5			G5		X	X	X	L.
Equisetum fluviatile	Water Horsetail	7	-5		S5			G5		X	X	R	L.
Equisetum variegatum ssp. variegatum	Variegated Horsetail	5	-3		S5			G5T5		X	X	R	Schleich. ex Fried., Weber & Mohr
Thelypteridaceae	**Marsh Fern Family**												
Thelypteris palustris	Marsh Fern	5	-4		S5			G5		X	X	X	Schott
GYMNOSPERMS	**CONIFERS**												
Cupressaceae	**Cedar Family**												
Juniperus virginiana var. virginiana	Red Cedar	4	3		S5			G5T5			X	L	L.
Thuja occidentalis	Eastern White Cedar	4	-3		S5			G5		X	X	X	L.
Pinaceae	**Pine Family**												
Abies balsamea	Balsam Fir	5	-3		S5			G5		X	X	X	(L.) Miller
Larix laricina	Tamarack	7	-3		S5			G5		X	X	X	(Du Roi) K. Koch
Pinus sylvestris	Scotch Pine		5	-3	SNA			GNA		X	X	I	L.
Tsuga canadensis	Eastern Hemlock	7	3		S5			G5		X	X	X	(L.) Carrière
Taxaceae	**Yew Family**												
Taxus canadensis	American Yew	7	3		S5			G5		X	X	X	Marshall
DICOTYLEDONS	**DICOTS**												
Aceraceae	**Maple Family**												
Acer rubrum	Red Maple	4	0		S5			G5		X	X	X	L.
Acer saccharum ssp. saccharum	Sugar Maple	4	3		S5			G5T5		X	X	X	Marshall
Apiaceae	**Carrot or Parsley Family**												
Daucus carota	Wild Carrot		5	-2	SNA			GNR		X	X	X	L.
Aristolochiaceae	**Duchman's-pipe Family**												
Asarum canadense	Wild Ginger	6	5		S5			G5		X	X	X	L.
Asclepiadaceae	**Milkweed Family**												
Asclepias syriaca	Common Milkweed	0	5		S5			G5		X	X	X	L.
Asteraceae	**Composite or Aster Family**												
Achillea millefolium	Yarrow		3	-1	S5			G5		X	X	X	L.
Bidens frondosa	Devil's Beggaticks	3	-3		S5			G5		X	X	X	L.
Centaurea stoebe	Spotted Knapweed		5	-3	SNA			GNR		X		X	Lam.
Cirsium arvense	Canada Thistle		3	-1	SNA			GNR		X	X	X	(L.) Scop.
Cirsium vulgare	Bull Thistle		4	-1	SNA			GNR		X	X	X	(Savi) Ten.
Erigeron philadelphicus ssp. philadelphicus	Philadelphia Fleabane	1	-3		S5			G5T5		X	X	X	L.
Erigeron strigosus	Daisy Fleabane	0	1		S5			G5		X		X	Muhlenb. ex Willd.
Eupatorium perfoliatum	Common Boneset	2	-4		S5			G5		X	X	X	L.
Euthamia graminifolia	Grass-leaved Goldenrod	2	-2		S5			G5		X	X	X	(L.) Nutt.
Eutrochium maculatum var. maculatum	Spotted Joe Pye Weed	3	-5		S5			G5T5		X	X	X	L.
Hieracium umbellatum	Umbellate Hawkweed				S5			G5		X	X		L.
Inula helenium	Elecampane Flower		5	-2	SNA			GNR		X	X	I	L.
Leucanthemum vulgare	Oxeye Daisy		5	-1	SNA			GNR		X	X	X	L.
Nabalus altissimus	Tall White Rattlesnake-root	5	3		S5			G5		X	X	X	L.
Pilosella caespitosa	Field Hawkweed		5	-2	SNA			GNR		X		I	Dumort.
Rudbeckia hirta	Black-eyed Susan	0	3		S5			G5		X	X	X	L.
Solidago cf. altissima	Tall Goldenrod	1	3		S5			G5		X	X	X	L.
Solidago caesia	Blue-stemmed Goldenrod	5	3		S5			G5		X	X	X	L.
Solidago gigantea	Smooth Goldenrod	4	-3		S5			G5		X	X	X	Aiton
Solidago cf. nemoralis ssp. nemoralis	Gray Goldenrod	2	5		S5			G5T5		X	X	X	Aiton
Solidago rugosa	Rough-leaf Goldenrod	4	-1		S5			G5		X	X	X	Aiton
Symphyotrichum lateriflorum	Starved Aster	3	-2		S5			G5		X	X	X	(L.) Britton
Symphyotrichum novae-angliae	New England Aster	2	-3		S5			G5		X	X	X	L.
Symphyotrichum cf. puniceum var. puniceum	Swamp Aster				S5			G5T5		X		X	L.
Taraxacum officinale	Common Dandelion		3	-2	SNA			G5		X	X	I	G. Weber
Tussilago farfara	Colt's Foot		3	-2	SNR			GNR		X	X	I	L.
Balsaminaceae	**Touch-me-not Family**												
Impatiens capensis	Spotted Jewelweed	4	-3		S5			G5		X	X	X	Meerb.
Berberidaceae	**Barberry Family**												
Caulophyllum thalictroides	Blue Cohosh	6	5		S5			G5		X	X	X	(L.) Michx.
Betulaceae	**Birch Family**												
Betula alleghaniensis	Yellow Birch	6	0		S5			G5		X	X	X	Britton
Ostrya virginiana	Eastern Hop-hornbeam	4	4		S5			G5		X	X	X	(Miller) K. Koch
Brassicaceae	**Mustard Family**												
Alliaria petiolata	Garlic Mustard		0	-3	SNA			GNR		X		X	(M. Bieb.) Cavara & Grande
Cardamine pensylvanica	Pennsylvania Bitter-cress	6	-4		S5			G5		X	X	X	Muhlenb. ex Willd.
Nasturtium officinale	Watercress		-5	-1	SNA			GNR		X			R. Br.
Campanulaceae	**Bellflower Family**												
Lobelia inflata	Indian Tobacco	3	4		S5			G5		X	X	X	L.
Lobelia siphilitica	Great Blue Lobelia	6	-4		S5			G5		X	X	X	L.
Caprifoliaceae	**Honeysuckle Family**												
Lonicera x bella	Bell's Honeysuckle		5	-3	SNA			GNA				I	Zabel
Sambucus canadensis	Common Elderberry	5	-2		S5			G5T5		X	X		L.
Sambucus racemosa	Red Elderberry	5	2		S5			G5		X	X	X	L.
Viburnum opulus	Cranberry Viburnum		0	-1	S5			G5		X		I	L.
Caryophyllaceae	**Pink Family**												
Cerastium fontanum	Common Mouse-ear Chickweed		3	-1	SNA			GNR		X	X	X	Baumg.
Silene vulgaris	Maiden's Tears		5	-1	SNA			GNR		X	X	I	(Moench) Garcke

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Stellaria longifolia	Longleaf Stitchwort	2	-4		S5			G5		X	X	RL	Muhlenb. ex Willd.
Cornaceae	**Dogwood Family**												
Cornus alternifolia	Alternate-leaf Dogwood	6	5		S5			G5		X	X	X	L. f.
Cornus sericea	Red-osier Dogwood	2	-3		S5			G5		X	X	X	Michx.
Cucurbitaceae	**Gourd Family**												
Echinocystis lobata	Wild Mock-cucumber	3	-2		S5			G5		X	X	X	(Michx.) Torr. & A. Gray
Fabaceae	**Pea Family**												
Lotus corniculatus	Bird's-foot Trefoil		1	-2	SNA			GNR		X	X	I	L.
Medicago lupulina	Black Medic		1	-1	SNA			GNR		X	X	I	L.
Medicago sativa ssp. *sativa*	Alfalfa		5	-1	SNA			GNRTNR		X	X	I	L.
Melilotus albus	White Sweetclover		3	-3	SNA			G5		X	X	I	Medik.
Trifolium pratense	Red Clover		2	-2	SNA			GNR		X	X	I	L.
Fagaceae	**Beech Family**												
Fagus grandifolia	American Beech	6	3		S4			G5		X	X	X	Ehrh.
Quercus rubra	Northern Red Oak	6	3		S5			G5		X	X	X	L.
Geraniaceae	**Geranium Family**												
Geranium robertianum	Herb-robert		5	-2	SNA			G5		X	X	I	L.
Grossulariaceae	**Currant Family**												
Ribes americanum	Wild Black Currant	4	-3		S5			G5		X	X	X	Miller
Ribes cynosbati	Prickly Gooseberry	4	5		S5			G5		X	X	X	L.
Guttiferae	**St. John's-wort Family**												
Hypericum perforatum	Common St. John's-wort		5	-3	SNA			GNR		X	X	I	L.
Hydrophyllaceae	**Water-leaf Family**												
Hydrophyllum virginianum	Virginia Waterleaf	6	-2		S5			G5		X	X	X	L.
Juglandaceae	**Walnut Family**												
Juglans nigra	Black Walnut	5	3		S4?			G5		X	X	X	L.
Lamiaceae	**Mint Family**												
Clinopodium vulgare	Field Basil	4	5		S5			G5			X	X	L.
Galeopsis tetrahit	Common Hempnettle		5	-1	SNA			GNR		X	X	I	L.
Glechoma hederacea	Ground Ivy		5	-2	SNA			GNR		X	X	I	L.
Leonurus cardiaca	Common Motherwort		5	-2	SNA			GNR		X	X	I	L.
Lycopus uniflorus	Northern Bugleweed	5	-5		S5			G5		X	X	X	Michx.
Mentha arvensis	Corn Mint	3	-3		S5			G5		X	X	X	L.
Prunella vulgaris ssp. *vulgaris*	Self-heal		0	-1	SNA			G5TU		X	X		L.
Oleaceae	**Olive Family**												
Fraxinus americana	White Ash	4	3		S4?			G5		X	X	X	L.
Fraxinus nigra	Black Ash	7	-4		S5?			G5		X	X	X	Marshall
Fraxinus pennsylvanica	Red Ash	3	-3		S5			G5		X	X	X	Marshall
Onagraceae	**Evening-primrose Family**												
Circaea alpina	Small Enchanter's Nightshade	6	-3		S5			G5		X	X	X	L.
Circaea lutetiana	Enchanter's Nightshade	3	3		S5			G5		X	X	X	L.
Epilobium ciliatum ssp. *ciliatum*	Hairy Willow-herb	3	3		S5			G5T5		X	X	X	Raf.
Epilobium parviflorum	Small-flower Willow-herb		3	-1	SNA			GNR		X	X	X	Schreb.
Oenothera biennis	Common Evening-primrose	0	3		S5			G5		X	X	X	L.
Oxalidaceae	**Wood Sorrel Family**												
Oxalis stricta	Upright Yellow Wood-sorrel	0	3		S5			G5		X	X	X	L.
Plantaginaceae	**Plantain Family**												
Plantago lanceolata	English Plantain		0	-1	SNA			G5		X	X	I	L.
Plantago rugelii	Rugel's Plantain	1	0		S5			G5		X	X	X	Decne.
Polygonaceae	**Smartweed Family**												
Rumex acetosa	Garden Dock		5	-1	SNA			G5					L.
Rumex obtusifolius	Bitter Dock		-3	-1	SNA			GNR		X	X	I	L.
Ranunculaceae	**Buttercup Family**												
Actaea pachypoda	White Baneberry	6	5		S5			G5		X	X	X	Elliott
Actaea rubra	Red Baneberry	5	5		S5			G5		X	X	X	(Aiton) Willd.
Anemone canadensis	Canada Anemone	3	-3		S5			G5		X	X	X	L.
Clematis virginiana	Virginia Virgin's-bower	3	0		S5			G5		X	X	X	L.
Ranunculus abortivus	Kidney-leaf Buttercup	2	-2		S5			G5		X	X	X	L.
Ranunculus acris	Tall Buttercup			-2	SNA			G5		X	X	I	L.
Ranunculus recurvatus	Hooked Buttercup	4	-3		S5			G5		X	X	X	Poir.
Thalictrum dioicum	Early Meadow-rue	5	2		S5			G5		X	X	X	L.
Rhamnaceae	**Buckthorn Family**												
Rhamnus cathartica	Common Buckthorn		3	-3	SNA			GNR		X	X	I	L.
Rosaceae	**Rose Family**												
Agrimonia gryposepala	Tall Hairy Groovebur	2	2		S5			G5		X	X	X	Wallr.
Crataegus monogyna	English Hawthorn		5	-1	SNA			G5		X	X	I	Jacq.
Fragaria virginiana	Virginia Strawberry	2	1		S5			G5		X	X	X	Miller
Geum aleppicum	Yellow Avens	2	-1		S5			G5		X	X	X	Jacq.
Geum canadense	White Avens	3	0		S5			G5		X	X	X	Jacq.
Geum fragarioides	Barren Strawberry	5	5		S5			G5		X	X	X	(Michx.) Tratt.
Geum rivale	Purple Avens	7	-5		S5			G5		X	X	RL	L.
Malus pumila	Common Apple		5	-1	SNA			G5		X	X	I	Miller
Potentilla simplex	Old-field Cinquefoil	3	4		S5			G5		X	X	X	Michx.
Prunus serotina	Black Cherry	3	3		S5			G5		X	X	X	Ehrh.
Prunus virginiana	Choke Cherry	2	1		S5			G5		X	X	X	L.
Pyrus communis	Common Pear		5	-1	SNA			G5		X		I	L.
Rubus allegheniensis	Alleghany Blackberry	2	2		S5			G5		X	X	X	Porter
Rubus idaeus ssp. *strigosus*	Red Raspberry	0	-2		S5			G5T5		X	X	X	L.
Rubus occidentalis	Black Raspberry	2	5		S5			G5		X	X	X	L.
Rubus pubescens	Dwarf Raspberry	4	-4		S5			G5		X	X	X	Raf.
Sorbus aucuparia	European Mountain-ash		5	-2	SNA			G5		X	X	I	L.
Rubiaceae	**Madder Family**												
Galium palustre	Marsh Bedstraw	5	-5		S5			G5		X	X	X	L.
Galium triflorum	Sweet-scent Bedstraw	4	2		S5			G5		X	X	X	Michx.

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Salicaceae	**Willow Family**												
Populus balsamifera	Balsam Poplar	4	-3		S5			G5		X	X	X	L.
Populus tremuloides	Trembling Aspen		0		S5			G5		X	X	X	Michx.
Salix bebbiana	Bebb's Willow	4	-4		S5			G5		X	X	X	Sarg.
Salix discolor	Pussy Willow	3	-3		S5			G5		X	X	X	Muhlenb.
Salix eriocephala	Heart-leaved Willow	4	-3		S5			G5		X	X	X	Michx.
Salix petiolaris	Meadow Willow	3	-4		S5			G5		X	X	X	Sm.
Saxifragaceae	**Saxifrage Family**												
Tiarella cordifolia	Heart-leaved Foam-flower	6	1		S5			G5		X	X	X	L.
Scrophulariaceae	**Figwort Family**												
Chelone glabra	White Turtlehead	7	-5		S5			G5		X	X	X	L.
Veronica anagallis-aquatica	Water Speedwell		-5	-1	SNA			G5		X	X	I	L.
Veronica officinalis	Common Speedwell		5	-2	SNA			G5		X	X	I	L.
Solanaceae	**Nightshade Family**												
Solanum dulcamara	Climbing Nightshade		0	-2	SNA			GNR		X	X	I	L.
Tiliaceae	**Linden Family**												
Tilia americana	American Basswood	4	3		S5			G5		X	X	X	L.
Ulmaceae	**Elm Family**												
Ulmus americana	White Elm	3	-2		S5			G5		X	X	X	L.
Urticaceae	**Nettle Family**												
Boehmeria cylindrica	False Nettle	4	-5		S5			G5		X	X	X	(L.) Sw.
Laportea canadensis	Wood Nettle	6	-3		S5			G5		X	X	X	(L.) Wedd.
Violaceae	**Violet Family**												
Viola pubescens	Yellow Violet				S5			G5		X	X	X	Aiton
Vitaceae	**Grape Family**												
Parthenocissus inserta	Inserted Virginia-creeper	3	3		S5			G5		X	X	X	(A. Kern.) Fritsch
Vitis riparia	Riverbank Grape	0	-2		S5			G5		X	X	X	Michx.
MONOCOTYLEDONS	**MONOCOTS**												
Araceae	**Arum Family**												
Arisaema triphyllum	Jack-in-the-pulpit	5	-2		S5			G5		X	X	X	(L.) Schott
Cyperaceae	**Sedge Family**												
Carex albursina	White Bear Sedge	7	5		S5			G5		X	X	R	E. Sheld.
Carex arctata	Drooping Wood Sedge	5	5		S5			G5		X	X	X	Boott
Carex aurea	Golden-fruited Sedge	4	-4		S5			G5		X	X	X	Nutt.
Carex bebbii	Bebb's Sedge	3	-5		S5			G5		X	X	X	(L.H. Bailey) Olney ex Fern.
Carex castanea	Chestnut Sedge	7	-4		S5			G5		R1	X	RL	Wahlenb.
Carex cristatella	Crested Sedge	3	-4		S5			G5		X	X	X	Britton
Carex deweyana	Dewey's Sedge	6	4		S5			G5		X	X	X	Schwein.
Carex flava	Yellow Sedge	5	-5		S5			G5		X	X	L	L.
Carex gracillima	Graceful Sedge	4	3		S5			G5		X	X	X	Schwein.
Carex granularis	Meadow Sedge	3	-4		S5			G5		X	X	X	Muhlenb. ex Willd.
Carex hystericina	Porcupine Sedge	5	-5		S5			G5		X	X	X	Muhlenb. ex Willd.
Carex interior	Inland Sedge	6	-5		S5			G5		X	X	X	L.H. Bailey
Carex intumescens	Bladder Sedge	6	-4		S5			G5		X	X	X	Rudge
Carex leptonervia	Finely-nerved Sedge	5	0		S5			G5		R1	X	L	(Fern.) Fern.
Carex peckii	Peck's Sedge	6	5		S5			G5		X	X	X	Howe
Carex cf. pedunculata	Long-stalked Sedge	5	5		S5			G5		X	X	X	Muhlenb. ex Willd.
Carex pellita	Woolly Sedge	4	-5		S5			G5		X	X	RL	Willd.
Carex pensylvanica	Pennsylvania Sedge	5	5		S5			G5		X	X	X	Lam.
Carex radiata	Eastern Star Sedge	4	5		S5			G5		X		X	(Wahlenb.) Small
Carex rosea	Rosy Sedge	5	5		S5			G5		X		X	Schkuhr ex Willd.
Carex scabrata	Rough Sedge	8	-5		S5			G5		X	X	L	Schwein.
Carex sparganioides	Burreed Sedge	5	0		S4S5			G5		X	X	X	Muhlenb. ex Willd.
Carex stipata	Awl-fruited Sedge	3	-5		S5			G5		X	X	X	Muhlenb. ex Willd.
Carex stricta	Tussock Sedge	4	-5		S5			G5		X	X	X	Lam.
Carex tenera	Straw Sedge	4	-1		S5			G5		X		X	Dewey
Carex utriculata	Beaked Sedge	7	-5		S5			G5		X	X	L	Boott
Carex vulpinoidea	Fox Sedge	3	-5		S5			G5		X	X	X	Michx.
Eleocharis erythropoda	Red-footed Spike-rush	4	-5		S5			G5		X	X	X	Steud.
Scirpus atrovirens	Dark-green Bulrush	3	-5		S5			G5?		X	X	X	Willd.
Scirpus cyperinus	Wool-grass	4	-5		S5			G5		R3	X	X	(L.) Kunth
Iridaceae	**Iris Family**												
Sisyrinchium montanum	Montane Blue-eyed-grass		-1		S5			G5		X	X	L	Greene
Juncaceae	**Rush Family**												
Juncus articulatus	Jointed Rush	5	-5		S5			G5		X	X	X	L.
Juncus dudleyi	Dudley's Rush	1	0		S5			G5		X	X	X	Wiegelb
Juncus effusus var. effusus	Soft Rush	4	-5		SNA			GNR		X	X	X	L.
Juncus inflexus	Incurved Rush		-3	-1	SNA			G5					L.
Juncus tenuis	Path Rush	0	0		S5			G5		X	X	X	Willd.
Liliaceae	**Lily Family**												
Asparagus officinalis	Garden Asparagus		3	-1	SNA			G5?		X	X	X	L.
Erythronium cf. americanum	Yellow Trout-lily	5	5		S5			G5		X	X	X	Ker Gawl.
Maianthemum canadense	Wild Lily-of-the-valley	5	0		S5			G5		X	X	X	Desf.
Maianthemum racemosum	False Solomon's Seal	4	3		S5			G5T		X	X	X	(L.) Link
Polygonatum pubescens	Downy Solomon's Seal	5	5		S5			G5		R1	X	X	(Willd.) Pursh
Trillium grandiflorum	White Trillium	5	5		S5			G5		X	X	X	(Michx.) Salisb.
Orchidaceae	**Orchid Family**												
Epipactis helleborine	Common Helleborine		5	-2	SNA			GNR		X	X	X	(L.) Crantz
Neottia ovata	Oval-leaved Twayblade				SNA			GNR		X	R1		(L.) R. Br.
Poaceae	**Grass Family**												
Agrostis gigantea	Redtop		0	-2	SNA			G4G5		X	X	I	Roth
Agrostis stolonifera	Redtop		-3		S5			G5		X	X	X	L.
Bromus inermis	Awnless Brome		5	-3	SNA			G5TNR		X	X	I	Leyss.
Bromus latiglumis	Broad-glumed Brome	7	-2		S4			G5		X	X	X	(Shear) Hitchc.
Dactylis glomerata	Orchard Grass		3	-1	SNA			GNR		X	X	I	L.
Glyceria striata	Fowl Meadow Grass	3	-5		S5			G5		X	X	X	(Lam.) A. Hitchc.
Leersia oryzoides	Rice Cut Grass	3	-5		S5			G5		X	X	X	(L.) Sw.
Oryzopsis asperifolia	White-grained Mountain-rice	6	5		S5			G5		X	X	X	Michx.
Phalaris arundinacea var. arundinacea	Reed Canary Grass	0	-4		S5			GNR		X	X	X	L.

Latin Name	Common Name	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status S-Rank	OMNR Status	COSEWIC Status	Global Status G-Rank		Local Status Wellington	Local Status Wellington Dufferin	Local Staus CVC/Peel	Authority
									Local Status Source	Frank and Anderson 2009	Riley 1989	CVC 2002	
Phragmites australis ssp. australis	European Reed				SNR			GNR					(Cav.) Trin. ex Steud.
Poa compressa	Canada Blue Grass	0	2		SNA			GNR		X	X	X	L.
Poa palustris	Fowl Meadow Grass	5	-4		S5			G5		X	X	X	L.
Poa pratensis ssp. pratensis	Kentucky Bluegrass	0	1		SNA			G5T5		X	X	X	L.
Schizachne purpurascens	False Melic Grass	6	2		S5			G5		X	X	X	(Torr.) Swallen
Typhaceae	**Cattail Family**												
Typha latifolia	Broad-leaved Cattail	3	-5		S5			G5		X	X	X	L.

STATISTICS		
Species Richness		
Total Number of Species:	208	
Native Species:	158	76%
Exotic Species:	50	24%
Locally Rare Species (Frank and Anderson, 2009):	4	3%
S1-S3 Species:	0	0%
S4 Species:	5	3%
S5 Species:	153	97%
Floristic Quality Indices		
Mean Co-efficient of Conservatism (CC)	4.0	
CC 0 - 3 = lowest sensitivity	57	37%
CC 4 - 6 = moderate sensitivity	83	54%
CC 7 - 8 = high sensitivity	13	8%
CC 9 - 10 = highest sensitivity	0	0%
Floristic Quality Index (FQI)	49	
Weedy and Invasive Species		
Mean Weediness Index:	-1.7	
-1 = low potential invasiveness	23	49%
-2 = moderate potential invasiveness	16	34%
-3 = high potential invasivenss	8	17%
Wetland Species		
Mean Wetness Index	0.3	
upland	44	22%
facultative upland	46	23%
facultative	31	15%
facultative wetland	53	26%
obligate wetland	28	14%

See next page for explanation of terms*

Table 3: Amphibian Call Count Survey Station Results

SURVEY ROUND	STATION NUMBER	SPECIES CODE												WATER	
		NOAM	AMTO	FOTO	GRTR	SPPE	CHFR	WOFR	NLFR	PIFR	GRFR	BULL	MIFR	Present (Y/N)	Depth (CM)
1	A	X												Y	No Access
2	A	X												Y	No Access
3	A	X												Y	No Access
1	B	X												Y	25cm
2	B					1(6)								Y	20cm
3	B										1(2)			Y	20cm
1	C					2(12)		1(1)						Y	40cm
2	C		1(1)			1(4)					1(2)			Y	30cm
3	C										1(1)			Y	20cm
1	D	X												Y	15cm

LEGEND:

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOAM	No Amphibians	No amphibians despite survey effort
AMTO	American Toad	*Anaxyrus americanus*
FOTO	Fowler's Toad	*Anaxyrus fowleri*
GRTR	Gray Treefrog	*Hyla versicolor*
CHFR	Western Chorus Frog	*Pseudacris triseriata*
WOFR	Wood Frog	*Lithobates sylvaticus*
NLRF	Northern Leopard Frog	*Lithobates pipiens*
PIFR	Pickerel Frog	*Lithobates palustris*
GRFR	Green Frog	*Lithobates clamitans*
BULL	American Bullfrog	*Lithobates catesbeianus*
MIFR	Mink Frog	*Lithobates septentrionalis*
SPPE	Spring Peeper	*Pseudacris crucifer*

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

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

Table 3: Amphibian Call Count Survey Station Results

SURVEY ROUND	STATION NUMBER	SPECIES CODE												WATER	
		NOAM	AMTO	FOTO	GRTR	SPPE	CHFR	WOFR	NLFR	PIFR	GRFR	BULL	MIFR	Present (Y/N)	Depth (CM)
2	D	X												Y	12cm
3	D	X												N	Dry
1	E	X												Y	No Access
2	E	X												Y	No Access
3	E	X												Y	No Access
1	F	X												Y	No Access
2	F	X												Y	No Access
3	F	X												Y	No Access
1	G					3(20)		1(4)						Y	No Access
2	G		1(2)			1(3)								Y	No Access

LEGEND:

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOAM	No Amphibians	No amphibians despite survey effort
AMTO	American Toad	*Anaxyrus americanus*
FOTO	Fowler's Toad	*Anaxyrus fowleri*
GRTR	Gray Treefrog	*Hyla versicolor*
CHFR	Western Chorus Frog	*Pseudacris triseriata*
WOFR	Wood Frog	*Lithobates sylvaticus*
NLRF	Northern Leopard Frog	*Lithobates pipiens*
PIFR	Pickerel Frog	*Lithobates palustris*
GRFR	Green Frog	*Lithobates clamitans*
BULL	American Bullfrog	*Lithobates catesbeianus*
MIFR	Mink Frog	*Lithobates septentrionalis*
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Note: For each species, the first number is the call code and the second number, which is in brackets, is the number of individuals of that species heard calling

Table 3: Amphibian Call Count Survey Station Results

SURVEY ROUND	STATION NUMBER	SPECIES CODE												WATER	
		NOAM	AMTO	FOTO	GRTR	SPPE	CHFR	WOFR	NLFR	PIFR	GRFR	BULL	MIFR	Present (Y/N)	Depth (CM)
3	G	X												Y	No Access
1	H							1(3)						Y	No Access
2	H	DRY												N	Dry
3	H	DRY												N	Dry

LEGEND:

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOAM	No Amphibians	No amphibians despite survey effort
AMTO	American Toad	*Anaxyrus americanus*
FOTO	Fowler's Toad	*Anaxyrus fowleri*
GRTR	Gray Treefrog	*Hyla versicolor*
CHFR	Western Chorus Frog	*Pseudacris triseriata*
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NLRF	Northern Leopard Frog	*Lithobates pipiens*
PIFR	Pickerel Frog	*Lithobates palustris*
GRFR	Green Frog	*Lithobates clamitans*
BULL	American Bullfrog	*Lithobates catesbeianus*
MIFR	Mink Frog	*Lithobates septentrionalis*
SPPE	Spring Peeper	*Pseudacris crucifer*

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

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

No.	X	Common Name	Species Code	Scientific Name	Provincial Status (S Rank)	Global Status (G Rank)	COSSARO (MNRF)	COSEWIC (Federal)	SWH Indicator Species	Highest Breeding Evidence
1	X	**Anseriformes**								
2	X	***Anatidae***								
8	X	Canada Goose	CANG	*Branta canadensis*	S5	G5			X	OB-X
37	X									
38	X	**Galliformes**								
39	X	***Phasianinae***								
46	X									
47	X	**Gaviiformes**								
48	X	***Gaviidae***								
51	X									
52	X	**Podicipediformes**								
53	X	***Podicipedidae***								
57	X									
58	X	**Suliformes**								
59	X	***Phalacrocoracidae***								
61	X									
62	X	**Pelecaniformes**								
63	X	***Ardeidae***								
66	X	Great Blue Heron	GBHE	*Ardea herodias*	S4	G5			X	OB-X
68	X	Green Heron	GRHE	*Butorides virescens*	S4B	G5			X	OB-X
70	X									
71	X	***Pelecanidae***								
73	X									
74	X	**Accipitriformes**								
75	X	***Cathartidae***								
77	X									
78	X	***Pandionidae***								
80	X									
81	X	***Accipitridae***								
89	X	Red-tailed Hawk	RTHA	*Buteo jamaicensis*	S5	G5			X	OB-X
92	X									
93	X	**Gruiformes**								
94	X	***Rallidae***								
101	X									
102	X	***Gruidae***								
104	X									
105	X	**Charadriiformes**								
106	X	***Charadriidae***								
112	X									
113	X	***Scolopacidae***								
138	X									
139	X	***Laridae***								
152	X									
153	X	**Columbiformes**								
154	X	***Columbidae***								
155	X	Rock Pigeon	ROPI	*Columba livia*	SNA	G5				PO-H
156	X	Mourning Dove	MODO	*Zenaida macroura*	S5	G5				PO-S
157	X									
158	X	**Cuculiformes**								
159	X	***Cuculidae***								
162	X									
163	X	**Strigiformes**								
164	X	***Strigidae***								
174	X									
175	X	**Caprimulgiformes**								
176	X	***Caprimulgidae***								
179	X									
180	X	**Apodiformes**								
181	X	***Apodidae***								
183	X									
184	X	***Trochilidae***								
186	X									
187	X	**Coraciiformes**								
188	X	***Alcedinidae***								
189	X	Belted Kingfisher	BEKI	*Megaceryle alcyon*	S4B	G5				PO-H
190	X									
191	X	**Piciformes**								
192	X	***Picidae***								
194	X	Red-bellied Woodpecker	RBWO	*Melanerpes carolinus*	S4	G5				PO-S
196	X	Downy Woodpecker	DOWO	*Picoides pubescens*	S5	G5				PO-S
199	X	Northern Flicker	NOFL	*Colaptes auratus*	S4B	G5				PO-S
200	X	Pileated Woodpecker	PIWO	*Dryocopus pileatus*	S5	G5			X	n/a
201	X									
202	X	**Falconiformes**								
203	X	***Falconidae***								
207	X									
208	X	**Passeriformes**								
209	X	***Tyrannidae***								
211	X	Eastern Wood-Pewee	EAWP	*Contopus virens*	S4B	G5	SC	SC	X	PO-S

No.	X	Common Name	Species Code	Scientific Name	Provincial Status (S Rank)	Global Status (G Rank)	COSSARO (MNRF)	COSEWIC (Federal)	SWH Indicator Species	Highest Breeding Evidence
215	X	Willow Flycatcher	WIFL	*Empidonax traillii*	S5B	G5			X	PO-S
218	X	Great Crested Flycatcher	GCFL	*Myiarchus crinitus*	S4B	G5				PO-T
220	X									
221	X	***Laniidae***								
224	X									
225	X	***Vireonidae***								
231	X	Red-eyed Vireo	REVI	*Vireo olivaceus*	S5B	G5				PR-T
232	X									
233	X	***Corvidae***								
235	X	Blue Jay	BLJA	*Cyanocitta cristata*	S5	G5				PR-P
236	X	American Crow	AMCR	*Corvus brachyrhynchos*	S5B	G5				PR-P
238	X									
239	X	***Alaudidae***								
241	X									
242	X	***Hirundinidae***								
247	X	Barn Swallow	BARS	*Hirundo rustica*	S4B	G5	THR	THR		OB-X
249	X									
250	X	***Paridae***								
251	X	Black-capped Chickadee	BCCH	*Poecile atricapillus*	S5	G5				PR-P
254	X									
255	X	***Sittidae***								
256	X	Red-breasted Nuthatch	RBNU	*Sitta canadensis*	S5	G5			X	PO-S
257	X	White-breasted Nuthatch	WBNU	*Sitta carolinensis*	S5	G5				PO-S
258	X									
259	X	***Certhiidae***								
261	X									
262	X	***Troglodytidae***								
268	X									
269	X	***Polioptilidae***								
271	X									
272	X	***Regulidae***								
275	X									
276	X	***Turdidae***								
283	X	American Robin	AMRO	*Turdus migratorius*	S5B	G5				PO-S
284	X									
285	X	***Mimidae***								
286	X	Gray Catbird	GRCA	*Dumetella carolinensis*	S4B	G5				PO-S
289	X									
290	X	***Sturnidae***								
291	X	European Starling	EUST	*Sturnus vulgaris*	SNA	G5				OB-X
292	X									
293	X	***Motacillidae***								
295	X									
296	X	***Bombycillidae***								
299	X									
300	X	***Calcariidae***								
303	X									
304	X	***Parulidae***								
305	X	Ovenbird	OVEN	*Seiurus aurocapilla*	S4B	G5			X	PR-T
316	X	Mourning Warbler	MOWA	*Geothlypis philadelphia*	S4B	G5				PO-S
317	X	Common Yellowthroat	COYE	*Geothlypis trichas*	S5B	G5				PO-S
319	X	American Redstart	AMRE	*Setophaga ruticilla*	S5B	G5				PO-S
327	X	Yellow Warbler	YWAR	*Setophaga petechia*	S5B	G5				PO-S
339	X									
340	X	***Emberizidae***								
343	X	Chipping Sparrow	CHSP	*Spizella passerina*	S5B	G5				PO-S
345	X	Field Sparrow	FISP	*Spizella pusilla*	S4B	G5			X	PO-S
347	X	Savannah Sparrow	SAVS	*Passerculus sandwichensis*	S4B	G5			X	CO-FY
351	X	Song Sparrow	SOSP	*Melospiza melodia*	S5B	G5				PR-P
357	X									
358	X	***Cardinalidae***								
360	X	Northern Cardinal	NOCA	*Cardinalis cardinalis*	S5	G5				PO-S
362	X	Indigo Bunting	INBU	*Passerina cyanea*	S4B	G5				PO-S
363	X									
364	X	***Icteridae***								
366	X	Red-winged Blackbird	RWBL	*Agelaius phoeniceus*	S4	G5				PO-S
372	X	Common Grackle	COGR	*Quiscalus quiscula*	S5B	G5				PO-H
373	X	Brown-headed Cowbird	BHCO	*Molothrus ater*	S4B	G5				PO-S
375	X	Baltimore Oriole	BAOR	*Icterus galbula*	S4B	G5				PO-S
376	X									
377	X	***Fringillidae***								
385	X	American Goldfinch	AMGO	*Spinus tristis*	S5B	G5				PR-P
387	X									

Species Common Name and Scientific Name: Consistent with the American Ornithologists' Union. 2012. Check-list of North American Birds. Available online: www.aou.org/checklist/north/full.php/

Species Code: Consistent with the American Ornithologists' Union. 2012. Species 4-Letter-Codes. Available online: www.birdsontario.org/atlas/codes.jsp?lang=en&pg=species/

No.	X	Common Name	Species Code	Scientific Name	Provincial Status (S Rank)	Global Status (G Rank)	COSSARO (MNRF)	COSEWIC (Federal)	SWH Indicator Species	Highest Breeding Evidence

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

S ranks: Provincial ranks are from the Natural Heritage Information Centre; S1 (critically imperiled), S2 (imperlied), S3 (vulnerable), S4 (apparently secure), S5 (secure); ranks were updated using NHIC species list October 2018

G ranks: Global ranks are from the Natural Heritage Information Centre; G1 (extremely rare), G2 (very rare), G3 (rare to uncommon), G4 (common), G5 (very common); ranks were updated using NHIC species list October 2018

COSSARO (MNRF): Ontario Species at Risk as listed by the Committee on the Status of Species at Risk in Ontario posted on Ontario Regulation 230/08 Species at Risk in Ontario website as of October 2018: https://www.ontario.ca/laws/regulation/080230/); END - Endangered, THR - Threatened, SC - Special Concern, NAR - Not at Risk

COSEWIC: Assessed Species at Risk at the national level as listed by the Committee on the Status of Endangered Wildlife in Canada (from COSEWIC October 2018: http://www.cosewic.gc.ca/eng/sct1/searchform_e.cfm/); END - Endangered, THR - Threatened, SC - Special Concern, NAR - Not at Risk

Table 5. Master Wildlife Table					
COMMON NAME	**SCIENTIFIC NAME**	**Provincial Status (S RANK)**	**Global Status (G RANK)**	**COSSARO (MNRF)**	**COSEWIC (Federal)**
ODONATA					
Ebony Jewelwing	*Calopteryx maculata*	S5	G5		
Fragile Forktail	*Ischnura posita*	S4	G5		
Eastern Forktail	*Ischnura verticalis*	S5	G5		
Lance-Tipped Darner	*Aeshna constricta*	S5	G5		
Common Green Darner	*Anax junius*	S5	G5		
Lancet Clubtail	*Gomphus exilis*	S5	G5		
Williamson's Emerald	*Somatochlora williamsoni*	S4	G5		
Calico Pennant	*Celithemis elisa*	S5	G5		
Dot-tailed Whiteface	*Leucorrhinia intacta*	S5	G5		
Twelve-Spotted Skimmer	*Libellula pulchella*	S5	G5		
Four-spotted Skimmer	*Libellula quadrimaculata*	S5	G5		
Common Whitetail	*Plathemis lydia*	S5	G5		
Yellow-legged Meadowhawk	*Sympetrum vicinum*	S5	G5		
Peck's Skipper	*Polites peckius*	S5	G5		
Tawny-edged Skipper	*Polites themistocles*	S5	G5		
Little Glassywing	*Pompeius verna*	S4	G5		
Dun Skipper	*Euphyes vestris*	S5	G5		
Black Swallowtail	*Papilio polyxenes*	S5	G5		
Eastern Tiger Swallowtail	*Papilio glaucus*	S5	G5		
Mustard White	*Pieris oleracea*	S4	G4G5		
Cabbage White	*Pieris rapae*	SNA	G5		
Clouded Sulphur	*Colias philodice*	S5	G5		
Eastern Tailed Blue	*Everes comyntas*	S5	G5		
Spring Azure	*Celastrina ladon*	S5	G5		
Great Spangled Fritillary	*Speyeria cybele*	S5	G5		
Red-spotted Purple	*Limenitis arthemis astyanax*	S5	G5T5		
Viceroy	*Limenitis archippus*	S5	G5		
Little Wood-Satyr	*Megisto cymela*	S5	G5		
Common Ringlet	*Coenonympha tullia*	S5	G5		
Common Wood-Nymph	*Cercyonis pegala*	S5	G5		
Monarch	*Danaus plexippus*	S4B, S2N	G4	SC	SC
AMPHIBIANS					
American Toad	*Anaxyrus americanus*	S5	G5		
Spring Peeper	*Pseudacris crucifer*	S5	G5		
Northern Green Frog	*Lithobates clamitans*	S5	G5		
Wood Frog	*Lithobates sylvatica*	S5	G5		
BIRDS					
Canada Goose	*Branta canadensis*	S5	G5		
Mallard	*Anas platyrhynchos*	S5	G5		
Great Blue Heron	*Ardea herodias*	S4	G5		
Green Heron	*Butorides virescens*	S4B	G5		

Wildlife Recorded from

COMMON NAME	SCIENTIFIC NAME	Provincial Status (S RANK)	Global Status (G RANK)	COSSARO (MNRF)	COSEWIC (Federal)
Red-tailed Hawk	*Buteo jamaicensis*	S5	G5		
Rock Pigeon	*Columba livia*	SNA	G5		
Mourning Dove	*Zenaida macroura*	S5	G5		
Belted Kingfisher	*Megaceryle alcyon*	S4B	G5		
Red-bellied Woodpecker	*Melanerpes carolinus*	S4	G5		
Downy Woodpecker	*Picoides pubescens*	S5	G5		
Northern Flicker	*Colaptes auratus*	S4B	G5		
Eastern Wood-Pewee	*Contopus virens*	S4B	G5	SC	SC
Willow Flycatcher	*Empidonax traillii*	S5B	G5		
Great Crested Flycatcher	*Myiarchus crinitus*	S4B	G5		
Red-eyed Vireo	*Vireo olivaceus*	S5B	G5		
Blue Jay	*Cyanocitta cristata*	S5	G5		
American Crow	*Corvus brachyrhynchos*	S5B	G5		
Barn Swallow	*Hirundo rustica*	S4B	G5	THR	THR
Black-capped Chickadee	*Poecile atricapillus*	S5	G5		
Red-breasted Nuthatch	*Sitta canadensis*	S5	G5		
White-breasted Nuthatch	*Sitta carolinensis*	S5	G5		
American Robin	*Turdus migratorius*	S5B	G5		
Gray Catbird	*Dumetella carolinensis*	S4B	G5		
European Starling	*Sturnus vulgaris*	SNA	G5		
Ovenbird	*Seiurus aurocapilla*	S4B	G5		
Mourning Warbler	*Geothlypis philadelphia*	S4B	G5		
Common Yellowthroat	*Geothlypis trichas*	S5B	G5		
American Redstart	*Setophaga ruticilla*	S5B	G5		
Yellow Warbler	*Setophaga petechia*	S5B	G5		
Chipping Sparrow	*Spizella passerina*	S5B	G5		
Field Sparrow	*Spizella pusilla*	S4B	G5		
Savannah Sparrow	*Passerculus sandwichensis*	S4B	G5		
Song Sparrow	*Melospiza melodia*	S5B	G5		
Northern Cardinal	*Cardinalis cardinalis*	S5	G5		
Indigo Bunting	*Passerina cyanea*	S4B	G5		
Red-winged Blackbird	*Agelaius phoeniceus*	S4	G5		
Common Grackle	*Quiscalus quiscula*	S5B	G5		
Brown-headed Cowbird	*Molothrus ater*	S4B	G5		
Baltimore Oriole	*Icterus galbula*	S4B	G5		
American Goldfinch	*Spinus tristis*	S5B	G5		
MAMMALS					
Eastern Small-footed Myotis	*Myotis leibii*	S2S3	G4	END	
Little Brown Myotis	*Myotis lucifugus*	S4	G3	END	END
Silver-haired Bat	*Lasionycteris noctivagans*	S4	G3G4		
Eastern Red Bat	*Lasiurus borealis*	S4	G3G4		
Big Brown Bat	*Eptesicus fuscus*	S4	G5		
Hoary Bat	*Lasiurus cinereus*	S4	G3G4		

Wildlife Recorded from

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

Table 6: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
1. SEASONAL CONCENTRATION AREAS					
Waterfowl Stopover and Staging Areas (terrestrial)	Yes (CUM1/CUT1) – present on and adjacent to the Subject Lands	No – No evidence of spring sheet water	N/A	N/A	Not present
Waterfowl Stopover and Staging Areas (aquatic)	Yes (SWD) – present on and adjacent to the Subject Lands	No – SWD communities not considered to provide sufficient surface water to support large numbers of migratory waterfowl	N/A	N/A	Not present
Shorebird Migratory Stopover Areas	Yes (MAM2) – adjacent to the Subject Lands	No – No evidence of muddy, un-vegetated shorelines	N/A	N/A	Not present
Raptor Wintering Areas	Yes (CUM/CUT and FOC/FOD) present in the landscape	Yes – Combination of fields and woodlands for foraging and roosting habitat	No – Feature treated as candidate significant habitat	NA	Candidate presence
Bat Hibernacula	No	N/A	N/A	N/A	Not present
Bat Maternity Colonies	Yes (FOD/SWD) – present on and adjacent to the Subject Lands	Yes – Cavity tree density surveys confirmed >10 trees per ha	Yes – Acoustic monitoring surveys completed in June 2016	Yes – Approximately 800 calls of Big Brown Bat were recorded in the 20 detector evenings	Confirmed

Table 6: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Turtle Wintering Areas	Yes (SW and MA) – present on and adjacent to the Subject Lands	Unknown – Areas on the Subject Lands did not contain sufficient water to provide turtle over-wintering habitat, however open water ponds adjacent to the Subject Lands may provide suitable habitat	N/A – No access to off-site features	N/A	Candidate present on adjacent lands
Colonial Bird Nesting Sites (bank/cliff)	Yes (CUM1/CUT1) – present on and adjacent to the Subject Lands	No – no suitable faces identified	N/A	N/A	Not present
Colonial Bird Nesting Sites (tree/shrubs)	Yes (SWD) – present on and adjacent to the Subject Lands	Yes	Yes	No – No evidence of heron colonies identified within the SWD communities on the Subject Lands	Not present
Colonial Bird Nesting Sites (ground)	No	N/A	N/A	N/A	Not present
Reptile Hibernacula	Yes – All ecosites to be considered	No – suitable candidate hibernacula features were not identified	N/A	N/A	Not present

Table 6: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Migratory Butterfly Stopover Areas	Yes	No – Subject lands greater than 5 km of Lake Ontario	N/A	N/A	Not present
Migratory Landbird Stopover Areas	Yes	No – Subject lands greater than 5 km of Lake Ontario	N/A	N/A	Not present
Deer Yarding Areas	Identified by MNRF – Not present on the Subject Lands based on search of LIO records	N/A	N/A	N/A	Not present
Deer Winter Congregation Areas	Yes	No – No woodlots >100 ha in size identified on or adjacent to the Subject Lands	N/A	N/A	Not present
2. RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE					
2a. Rare Vegetation Communities					
Rare Vegetation Types (cliffs, talus slopes, sand barrens, alvars, old-growth forests, savannahs, and tallgrass prairies)	No	N/A	N/A	N/A	Not present

Table 6: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Other Rare Vegetation Types (S1 to S3 communities)	No	N/A	N/A	N/A	Not present
2b. Specialized Wildlife Habitat					
Waterfowl Nesting Area	Yes (hayfields adjacent to wetland communities)	Yes – hayfields extend greater than 120 m from the wetlands	Yes – considered during breeding bird surveys	No – No evidence of nesting waterfowl identified on the Subject Lands	Not Present
Bald Eagle and Osprey Habitats	Yes (SWD, FO) – present on and adjacent to the Subject Lands	Yes	Yes	No – No evidence of Bald Eagle or Osprey nests identified during surveys on the Subject Lands	Not present
Woodland Raptor Nesting Habitat	Yes (SWD, FO) – present on and adjacent to the Subject Lands	No – No woodlands > 30 ha in size with > 10 ha of interior forest habitat	N/A	N/A	Not present
Turtle Nesting Areas	No – No exposed mineral soil areas identified during surveys on the Subject Lands	N/A	N/A	N/A	Not present
Seeps and Springs	Yes – evidence of groundwater seepage was noted within the SWD communities on the Subject Lands	Yes	N/A	N/A	Confirmed

Table 6: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Woodland Amphibian Breeding Habitats (within or < 120m from woodland)	Yes – breeding pools present within 120 m of a woodland community	Yes – wetlands/pools considered to provide suitable breeding habitat	Yes – amphibian calling surveys completed in accordance with the Marsh Monitoring Program protocols	No – Three of the indicator species were identified, however surveys did not identify greater than 20 individuals of two species in any feature	Not present
Wetland Amphibian Breeding Habitats (wetland >120m from woodland)	No – All wetlands within 120 m of a woodland community	N/A	N/A	N/A	Not present
Woodland Area-Sensitive Bird Breeding Habitat	No – Woodland communities greater 30 ha with presence of interior forest identified	N/A	N/A	N/A	Not present
3. SPECIES OF CONSERVATION CONCERN					
Marsh Bird Breeding Habitat	Yes (MAM) – found adjacent to the Subject Lands	Yes	Yes – breeding bird surveys to be completed	No	Not present
Open Country Bird Breeding Habitat	Yes (CUM1) – present adjacent to the Subject Lands	No – Area is less than 30 ha in size	N/A	N/A	Not present

Table 6: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Shrub/Early Successional Bird Breeding Habitat	Yes (CUT1) – present on and adjacent to the Subject Lands	Yes – Area is greater than 10 ha in size	Yes – breeding bird surveys to be completed within portions of the habitat where possible	No – Neither of the indicator species was identified	Not present
Terrestrial Crayfish	Yes (SWD and MAM) – present on and adjacent to the Subject Lands	Yes	Yes – identification of crayfish chimneys to be considered as a component of other surveys	No – no crayfish chimneys identified	Not present
Special Concern and Rare Wildlife Species					
(i) Gypsy Cuckoo Bumble Bee	Yes – known to occur in diverse habitats	N/A	Yes – considered during insect surveys	No – not identified	Not present
(ii) West Virginia White	Yes – moist deciduous woodlands	N/A	Yes – considered during insect surveys	No – not identified	Not present
(iii) Eastern Wood-Pewee	Yes – present in woodland communities	N/A	Yes – to be assessed as a component of	Yes – presence of Eastern Wood-pewee within	Present

Table 6: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
			breeding bird surveys	woodlands on the Subject Lands was confirmed.	
(iv) Canada Warbler	Yes – present in wet woodlands	N/A	Yes – to be assessed as a component of breeding bird surveys	No – not identified	Not present
(v) Chimney Swift	No – no chimneys or large hollow trees identified on the Subject Lands	N/A	N/A	N/A	Not present
(vi) Grasshopper Sparrow	Yes – open grasslands present	N/A	Yes – to be assessed as a component of breeding bird surveys	No – not identified	Not present
(vii) Wood Thrush	Yes – present in woodlands	N/A	Yes – to be assessed as a component of breeding bird surveys	No – not identified	Not present
(viii) Snapping Turtle	Yes – may be present in wetland communities	N/A	Yes – to be considered incidentally as no access to potential over-	No – none identified	Candidate presence associated with off-site over-

Table 6: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
			wintering habitats		wintering habitat
(ix) Western Chorus Frog	Yes – may be present in wetland communities	N/A	Yes – considered during amphibian calling surveys	No – not identified	Not present
4. ANIMAL MOVEMENT CORRIDORS					
Amphibian Movement Corridors	Not required to assess given absence of identified significant amphibian breeding habitat				
Deer Movement Corridors	Not required to assess given absence of identified significant deer wintering habitat				

Table 8. Savanta Field Studies and Natural Inventories

FIELD DATE	NATURE OF INVESTIGATION	SURVEYOR
2016		
May 26	Amphibian Call Count Survey (Round 2)	J. Leslie
June 13	Breeding Bird Survey (Round 1)	L. Foerster
June 13	Spring Botanical Inventory	J. Leslie
June 23	Amphibian Call Count Survey (Round 3)	J. Leslie C. Collinson
June 23	Breeding Bird Survey (Round 2)	S. Male
July 5	Breeding Bird Survey (Round 3)	S. Male
July 7	Aquatic Habitat Assessment	S. Lohnes C. Collinson
August 2	Summer Botanical Inventory Ecological Land Classification	J. Leslie
August 8	Insect Survey	P. Burke L. Williamson
November 11	Bat Habitat Assessment	J. Leslie S. Male
2017		
April 10	Amphibian Call Count Survey (Round 1)	J. Leslie
June 12	Deployment of Bat Acoustic Instruments	O. Park
June 22	Retrieval of Bat Acoustic Instruments	O. Park

Appendix C – Agency Correspondence

Ministry of Natural Resources And Forestry

Ministère des Richesses naturelles et des Forets

Guelph District
1 Stone Road West
Guelph, Ontario
N1G 4Y2

Telephone: (519) 826-4955
Facsimile: (519) 826-4929

Ontario

July 7, 2016

Olivia Park
Ecologist
Savanta Inc.
Toll Free: 1-800-810-3281 ext. 122
oliviapark@savanta.ca

Dear Olivia,

Thank you for your inquiry regarding the presence of species at risk and natural heritage features for 5431 8th Line Town of Erin, Ontario.

Digital mapping for some natural heritage features is available from Land Information Ontario (LIO). MNRF recommends contacting LIO to obtain relevant feature mapping. Datasets of potential interest (and the corresponding LIO dataset) include – wetlands ('Wetland Unit' dataset), ANSI ('ANSI dataset), wooded areas ('Wooded Areas'), wintering areas ('Wintering Areas'), and fish spawning areas ('Spawning Areas').

The Ministry of Natural Resources and Forestry (MNRF) has had an opportunity to review the natural heritage records and information available at the Guelph District Office, for the above noted file. Please see below for the following information and comments to address your questions noted in the email correspondence.

Wetlands
The Ministry notes that the Provincially Significant West Credit River Wetland Complex is currently identified within or directly adjacent to the identified land.

ANSI
The Ministry notes that no ANSI's are currently identified within or directly adjacent to the identified land.

Species at Risk
The Ministry notes that there are no species at risk (SAR) records for the area. Based on the characteristics of the site, there are several species at risk that have the potential to be present. This includes:

Little Brown Bat	END
Northern Myotis	END
Tri-Coloured Bat	END
Butternut	END

Please see the attached document to determine what other species at risk may be present. Please note that because the province has not been surveyed comprehensively for the presence of species at risk (SAR), the absence in the NHIC database of an EO in a particular geographic area does not indicate the absence of the species in that area. Consequently, the presence of an EO is useful to flag the presence of the species in the area, but is not an appropriate tool to determine whether a species is absent, or whether it should be surveyed for or not in a particular area.

Consequently, we provide the following advice with respect to determining the presence of species at risk on a property for which a land-use change or on-the-ground activity is being proposed (note that some of the following may not apply to a given type of proposed activity, or for a given study area):

I. Habitat Inventory

The District recommends undertaking a comprehensive botanical inventory of the entire area that may be subject to direct and indirect impacts from the proposed activity. The vegetation communities and aquatic habitats in

the study area should be classified as per the "Ecological Land Classification (ELC) for Southern Ontario" system, to either the "Ecosite" or "Vegetation Type" level. With respect to aquatic habitats in the study area, we recommend you collect data on the physical characteristics of the waterbodies and inventory the riparian zone vegetation, so that these habitats can be classified as per the Aquatic Ecosites described in the ELC manual.

II. Potential SAR on the property

A list of species at risk that have the potential to occur in the area can be produced by cross- referencing the ecosites described during the habitat inventory with the habitat descriptions of species at risk known to occur in the county or regional municipality within which the area is located. The species-specific COSEWIC status reports (www.cosewic.gc.ca) are a good source of information on species at risk habitat needs and will be helpful in determining the suitability of the property's ecosites for a given species.

Please note that the Species at Risk in Ontario list (SARO) is a living document and is amended periodically as a result of species assessment and re-assessments conducted by the Committee on the Status of Species at Risk in Ontario (COSSARO). The SARO list can be accessed on the webpage http://www.ontario.ca/environment-and-energy/species-risk-ontario-list

COSSARO also maintains a list of species to be assessed in the future. It is recommended to take COSSARO's list of anticipated assessments into consideration, especially when the proposed start date of the activity is more than 6 months away, or the project will be undertaken over a period greater than 6 months. The list can be viewed by going to http://www.ontario.ca/page/how-comment-protecting-species-risk.

III. SAR surveys

The District is of the opinion that each species at risk identified under Step II should be surveyed for, regardless of whether or not the species has been previously recorded in the area, or whether previous records are historical in nature. The survey report should describe how each species at risk was surveyed for, and provide a rationale for why, if any, certain species appearing on the county/ regional municipal list were not the subject of the survey. These rationales must be based on evidence demonstrating either that: suitable habitat for the species is not present on the property or; the project will not have any impacts -including indirect impacts- on the species. Some SAR surveys require an authorization under the *Endangered Species Act 2007* and/or a Scientific Collector's Permit; please contact the Guelph District office if you require further direction regarding these.

Guelph District additionally recommends contacting the municipal planning approval authority and the conservation authority to determine if they have any additional information or records of interest for the study area. Please contact our office if your investigations reveal the presence of species at risk on the subject property. MNRF will be happy to provide further advice regarding the provisions of the *Endangered Species Act* at that time.

We require more detailed information on the proposed project in order to assess the impacts of the works on Species at Risk. *When project details have been determined*, please fill out an Information Gathering Form (IGF) for any *threatened* or *endangered* species listed in the provided letter and submit it to our office (to ESA.Guelph@ontario.ca). The IGF can be found here (along with its associated guide). Please include detailed descriptions of the undertakings such as proposed timing and phasing of the project and details on what is required at each phase.

All sections and tables should be filled out in their entirety – incomplete forms will be returned and may delay the review process. Any applicable supplemental information that will assist with the review process should also be submitted with the IGF (e.g. field survey results, site plan/drawings, ELC mapping, etc.). Please note that forms are reviewed in the order in which they are received by MNRF and we will contact you with our response once the review is complete.

Sincerely,

Melinda Thompson

MELINDA J. THOMPSON

MANAGEMENT BIOLOGIST
ONTARIO MINISTRY of NATURAL RESOURCES and FORESTRY
melinda.thompson@ontario.ca

Erin

Date Generated: July 7, 2016

Bird	SARO	Protection	Habitat Information	Timing Windows	Survey Protocol
Bank Swallow *Riparia riparia*	THR	Species Protection and General Habitat Protection	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers.	Migrate South before Winter	Follow Breeding Bird Survey Protocol. Colony and Roost information should be recorded and submitted using Bird Studies Canada's Ontario Bank Swallow Project data forms (2010).
Barn Swallow *Hirundo rustica*	THR	Species Protection and General Habitat Protection	Prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Migrate South before Winter	Follow Breeding Bird Survey Protocol
Bobolink *Dolichonyx oryzivorus*	THR	Species Protection and General Habitat Protection	Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Canada Warbler *Cardellina canadensis*	SC	N/A	Generally prefers wet coniferous, decidiuous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Arrive in Early May Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Chimney Swift *Chaetura pelagica*	THR	Species Protection and General Habitat Protection	Historically found in deciduous and coniferous, usually wet forest types, all with a well developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Nesting - Late April to Mid-May Migrate South in September or Early October	Chimney Swift Monitoring Protocol. Bird Studies Canada, March 2009

Common Nighthawk *Chordeiles minor*	SC	N/A	Generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops).	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Eastern Meadowlark *Sturnella magna*	THR	Species Protection and General Habitat Protection	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Migrate South for the Winter	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Eastern Whip-poor-will *Caprimlugus vociferus*	THR	Species Protection and General Habitat Protection	Generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred; In winter they occupy primarily mixed woods near open areas.	Nesting: May - July	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Golden-winged Warbler *Vermivora chrysoptera*	SC	N/A	Generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Fish	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
Redside Dace *Clinostomus elongatus*	END	Species Protection and Habitat Regulation	Generally found in pools and slow-moving areas of small headwater streams with a moderate to high gradient	Spawning occurs in May	Contact MNR Guelph District Management Biologist to obtain a copy of the protocol
Insect	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**

Monarch Butterfly *Danaus plexippus*	SC	N/A	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Usually migrate south in late September and October	Watch for adults along roadsides and in open fields. Caterpillars feed on milkweeds: Common milkweed grows in open disturbed habitats (fields, roadsides, etc) and swamp milkweed grows in wet habitats (along streams, lakes, marshes) Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.
Rusty-patched Bumble Bee *Bombus affinis*	END	Species Protection and General Habitat Protection	Generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows	Active from early Spring to late Fall	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
West Virginia White *Pieris virginiensis*	SC	N/A	Generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Adult butterfly emerges from pupa in late March; flies only in April and May	Watch for adults within moist, deciduous woodlands Caterpillars feed on the two-leaved toothwort: Toothwort grows in damp, open, rich hardwood woodlands and blooms from April to June. Adults can be spotted from a distance; caterpillars must be searched for carefully by checking host plant
Mammal	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
Eastern Small-footed Myotis *Myotis leibii*	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	Hibernates in caves and mines during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol

Little Brown Myotis *Myotis lucifugus*	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Northern Myotis *Myotis septentrionalis*	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often asssociated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Tri-coloured Bat *Perimyotis subflavus*	END	Species Protection and General Habitat Protection	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Can be in trees or dead clusters of leaves or arboreal lichens on trees. May also use barns or similar structures.	Hibernates during winter	Contact MNRF Guelph District Management Biologist to obtain a copy of the protocol
Mollusc	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
Rainbow Mussel *Villosa iris*	THR	Species Protection and General Habitat Protection	Most abundant in shallow, well-oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel, sand and occasionally mud	Active Year Round	Please reference: Mackie, G, T.J Morris, and D Ming. "Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA)." Fisheries and Oceans Canada. (2008): Print.
Plant	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
American Ginseng *Panax quinquefolius*	END	Species Protection and General Habitat Protection	Grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	Flowering begins in June and continues until August The fruit develop from July to August and ripen in August and September	Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters Use a plant field guide to distinguish from similar species

Butternut *Juglans cinerea*	END	Species Protection and General Habitat Protection	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Flowers from April to June. Fruits reach maturity during the month of September or October	Walk slowly and systematically in grid fashion through suitable habitat pausing every 30 meters for a detailed scan of trees within sight. Areas with dense foliage or many saplings will require a more intensive survey to detect sapling butternut. Use Butternut Health Assessment Protocol if planning on removing trees.
Reptile	**SARO**	**Protection**	**Habitat Information**	**Timing Windows**	**Survey Protocol**
Snapping Turtle *Chelydra serpentina*	SC	N/A	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Nesting: Late May and June Hibernate: October - April	Scan offshore rocks and logs for basking turtles (10am-2pm) Snorkel in desired aquatic habitat Nesting Season: Search known or preferred nesting habitat areas for females

Sean Male <seanmale@savanta.ca>

8th Line - Suggested EIS Work Plan for Review

Rick Hubbard <rickhubbard@savanta.ca> Wed, May 18, 2016 at 4:43 PM
To: Suzie Losiak <SLosiak@creditvalleyca.ca>
Cc: francesco labricciosa <homesinthehills4u@live.ca>, Stephanie Mowbray <Stephanie.mowbray@hotmail.com>, Sean Male <seanmale@savanta.ca>, JCampbell@creditvalleycons.com, John Cox <jlcox@coxplan.ca>

Good afternoon Suzie - as per our recent meeting at the Town of Erin, I would like to provide you and Josh with a suggested work plan for your consideration. Have a look and I would be pleased to discuss with you at your convenience. We are now in the process of scheduling our initial amphibian survey just to ensure we can capture Round Two.

Thanks again for your inputs thus far.

You'll see in the attached memo that we have requested a field visit from Steve Varga and we will keep you updated on when that will occur. We had also talked about us coordinating a joint field visit to the property. I'm not sure who you were thinking of inviting on your end - I am wondering if you might canvass staff and provide a couple of potential dates and we will do our best to work around your schedules.

Many thanks Suzie,

Regards,
Rick

Town of Erin Work Plan for CVC.doc
56K

SAVANTA

May 18, 2016

Suggested EIS Work Plan for Proposed Estate Residential Application, Town of Erin

It was great to see you and Josh recently Suzie, and I know that Francesco has very much appreciated the time provided by yourself and staff to consider this property as he has gone through his due diligence. Following from our meeting, Francesco (Homes in the Hills Inc.) has retained Savanta to complete an Environmental Impact Study (EIS) as part of his application to create an estate residential development on the Subject Lands, as shown in the attached Figure).

As we discussed, I would like to provide you with a suggested Terms of Reference for your review and comment regarding the work plan for the completion of the EIS. The information below summarizes the desktop and field studies planned to provide an ecological characterization. The Subject Lands, which are located within the Urban Centre of the Town of Erin, consist of a mixture of active agricultural fields, and natural areas (wetlands, woodlands), with two watercourses crossing the Subject Lands. The riparian habitats around the two identified watercourses are considered to be Core Greenlands within the Town of Erin Official Plan (2004), while much of the surrounding landscape are considered to be Greenlands. Much of the site is located within Credit Valley Conservation (CVC)'s generic regulation limit (as a result of proximity to the watercourses and wetland communities on and adjacent to the Subject Lands.

Policy 4.3.1 of the Town of Erin Official Plan (2004) states that an EIS shall be required for development proposed within an area identified as Greenlands. Further, as we discussed in our meeting we know that the CVC and the Town will require an EIS to address potential impacts to the West Credit River Provincially Significant Wetland complex on the Subject Lands as well as other natural heritage features on, and adjacent to these Subject Lands.

In order to support the completion of an EIS on the proposed development, Savanta will complete the following tasks to support the description of the existing site conditions:

- ***Preliminary site visit with CVC*** – as discussed, Savanta will schedule a site visit with appropriate CVC staff to jointly familiarize ourselves with the extent and quality of natural heritage features and development opportunities and constraints.
- **Review of background information** – Savanta will review a variety of background material, including, but not limited to:
    - Relevant planning documents
    - Natural Heritage Information Centre data
    - Publically available atlas data, such as the Ontario Breeding Bird Atlas
    - Information obtained from the Ontario Ministry of Natural Resources and Forestry (MNRF) though a species at risk information request
- ***Engaging of the MNRF***
    - We will be shortly submitting a formal Information Request Form to the Aurora MNRF;
    - We have already submitted a formal request from Steve Varga to include this site in his early season wetland mapping schedule. We will advise you of his dates as soon as we hear from him – should you or other CVC staff be interested in attending.
- ***Field studies*** – Savanta, or others, will complete the following field studies in order to enhance the understanding of the site conditions gathered through the background review:

- Biophysical inventory, including geotechnical, site servicing, and hydrogeological assessments (Francesco is just in the process of engaging a site engineer for completion of an Functional Servicing Report etc, and a hydrogeological firm to complete updated groundwater assessment).
- Ecological Land Classification.
- Botanical Inventory (Spring and Summer) to document vegetation species – at this stage, based on the preliminary examination of the property, and the expected limits of development within the open areas, we are anticipating that two surveys would be adequate.
- Two rounds of amphibian call surveys according to the Marsh Monitoring Program guidelines (Bird Studies Canada, 1994) – we are just into Round Two and we will ensure that we capture the Round Two and Round Three windows.
- Three rounds of breeding bird surveys (area searches and point counts), completed according to the Ontario Breeding Bird Atlas protocols, which will includes surveys at least three weeks apart, completed between dawn and five hours after dawn.
- Aquatic habitat assessments of the watercourses, including placement of temperature loggers.
- Incidental wildlife observations will be taken during all surveys.
- As I mentioned during our meeting, the site tablelands do contain two relatively small blocks of what appeared to be aging conifer plantation – one is quite small and the other somewhat larger. The potential may be there to consider removal of at least the smaller block. To the extent that we may need to consider snag surveys for bats, we will do so.

Reporting

Once the description of the existing environment is completed, the EIS will be prepared, and will include the following:

- Description of the proposed development, including location and nature;
- Description of the existing environment on, and adjacent to, the Subject Lands;
- A water balance assessment will be completed, with a focus on determining any potential impacts that could occur to the adjacent wooded and wetland areas (which include the watercourses). Mitigation measures and LID techniques will be considered through this analysis and will be discussed within the EIS;
- Determination of the significant features as per the Provincial Policy Statement and Regional Official Plan;
- Identification and assessment of potential impacts of the proposal, including those on natural heritage features and their ecological functions; and
- A key aspect of the EIS will include a focused examination of the two existing crossings of the watercourse features on the property. Both these crossings would be critical for accessing the northern tableland blocks and the roads in these areas will utilize the existing culvert crossing locations, although it is recognized that there will be additional impacts to the watercourses given the road widths.